Electrical Review

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Merchandising Plan for Selling Electrical Wiring

Advance Report of Wiring Committee of the National Electric Light Association, Devoted to Presentation of Modern Methods of Spreading the Electrical Idea to Every American Household

This is the first of a series of three articles on house wiring by the Wiring Committee of the National Electric Light Association. R. S. Hale, of the Edison Electric Illuminating Co., Boston, is chairman of the Wiring Committee. He appointed the following subcommittee to prepare these articles: A. L. Nelson, superintendent, Interior Wiring Division, Commonwealth Edison Co., Chicago, chairman; C. Renshaw, National Metal Molding Co., Pittsburgh, and R. H. Tillman, Consolidated Electric Light & Power Co., Baltimore. The second article will deal with estimating of house wiring and method of figuring by a set schedule of prices for different types of buildings. The third article will be devoted to material and methods of installation, and the relation of the utility company and the contractor.

The advance of a victorious army during the great war usually consisted of two distinct parts: A swift rush forward in which the most of the enemy were driven back, and a "mopping up," by which the conquered trenches were made thoroughly secure. The electrical industry is apparently proceeding in the same way. The swift rush has made a deep impression on the activi-

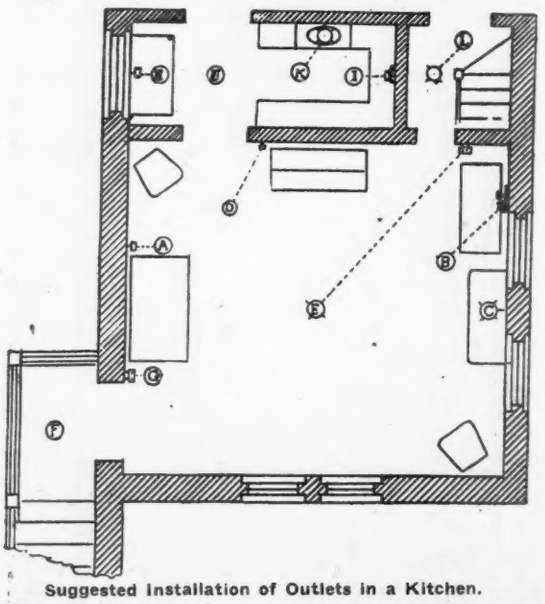
Comfort and Attractiveness Made Possible in the Home When Sufficient Convenience Outlets Have Been Provided.

ties of the country, but there remain for "mopping up" some 15,000,000 homes which have never been wired. Estimating the number of electrical contractors as apparently 20,000, this gives an average of 750 existing residences for each contractor to wire in addition to caring for the new buildings.

We are not making the progress that we should in this tremendous task, either in the number of houses wired or in the thoroughness with which the work is done. This is not because we do not know how to wire, but rather because we have never applied the principles of merchandising to selling the wiring idea. Most of us are so familiar ourselves with the advantages of being able to use electricity that we assume everyone else is equally so. We all know that to sell electrical appliances we must paint attractive pictures for the public of the comforts and convenience which they will secure from the purchase. In the matter of wiring, however, we have mostly assumed that a mere statement of our willingness to take orders on a partial payment was all that was necessary.

Subtle Advertising Adaptable to Selling Wiring.

The common attitude of the electrical industy toward wiring, as compared with its attitude toward the sale of appliances, is illustrated nicely by two advertisements which appeared recently in the newspapers of a certain city. One of these advertisements bore the heading in large letters, "Wire Your House Now," and proceeded to tell about the monthly payment plan. It gave prosaic specifications as to the kinds of fixtures which would be included, etc. This advertisement, no doubt, was very interesting to people who had already decided to have their houses wired and who were wondering where to go to get it done. There was absolutely nothing, however, to convince those who had not reached such a decision that they ought to have the wiring done.



Suggested Installation of Outlets in a Kitchen.

NOTE.—Outlet for electric range (A). Double outlet near sink for dish washer and utility motor (B). Lighting bracket between windows (C). Extra outlet in wall for attaching electric fan or other appliance (D). Ceiling fixture (E). Light on back porch (F), controlled by switch (G). Outlet in pantry for refrigeration (H), and extra outlet for portable stove, plate warmer, drink mixer, etc. (I). Ceiling light in pantry (J), and bracket light (K). Ceiling light for rear stairs (L).

The other advertisement was a good one. It carried the heading in fancy letters, "Oh, Boy!" and showed a man with an electric fan blowing full in his face. His hair and tie were waving vigorously and he wore a smile of pleasure and contentment. After looking at the picture a moment or two, one could almost feel the breeze. The text then began: "Why go to the seashore or the mountains when the mere touch of your finger will bring cooling sea breezes into your office, your bedroom or living room? Why swelter in the summer heat without ambition or energy to perform your work when at an insignificant expense you can assure yourself of cool, comfortable, refreshing surroundings?"

That advertisement, of course, was intended to sell fan motors and not wiring, but no one can use fan motors unless his house or office is wired. By the addition or the change of a very few words this same wonderful bit of merchandising could have been made to sell wiring instead of, or in addition to, fans. This advertisement occupied less than one-half the space of the one previously referred to, and yet it is felt one insertion of it would have done more good in persuading people to wire their homes than a week's run of the other.

Persuading people to wire, however, is only the beginning. Having applied merchandising principles to interest prospects in wiring we must again apply them to persuading these purchasers to adopt the right kind. Many contractors in quoting on wiring residences will begin in a very serious way, something like this:

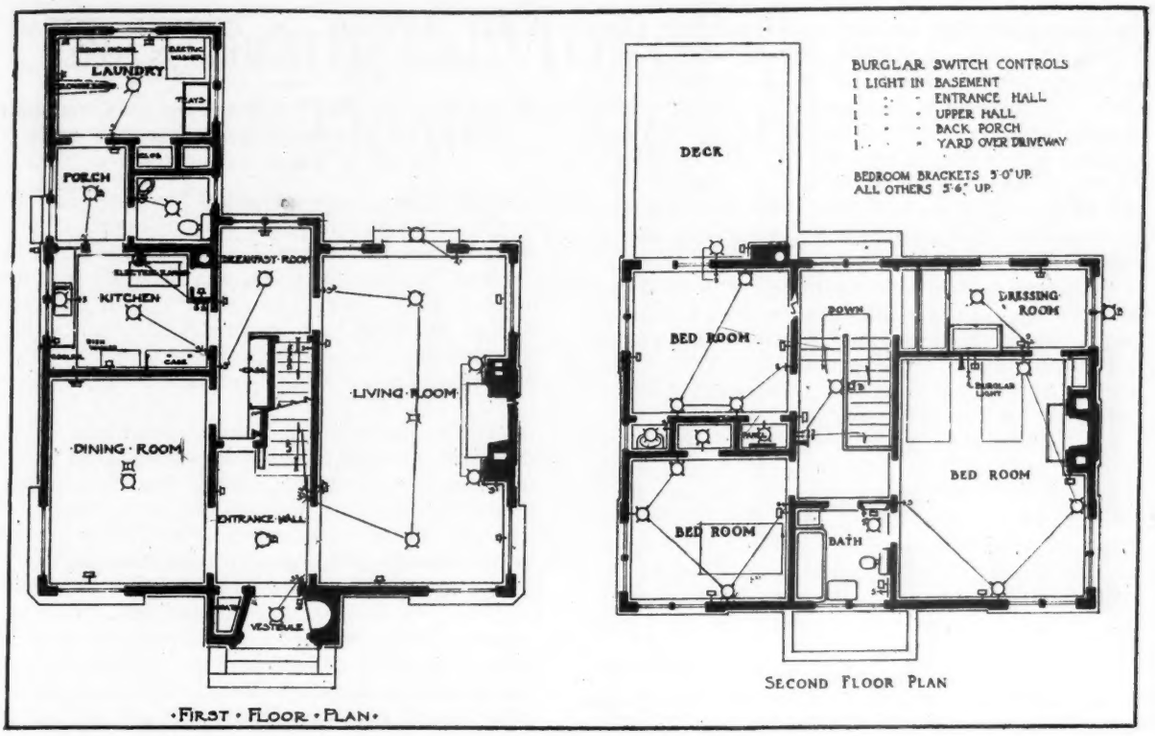
> "Dear Sir: We hereby propose to furnish labor and material necessary to install wiring and switches in the 2-story residence owned by you at 711 Blank street.
>
> The work to be done under this contract will consist of wiring.....outlets for .....lights; .....outlets for single pole switches; and.....outlets for 3-way switches as follows:"

Then follows a list of rooms and a table giving the number of ceiling, bracket, baseboard and switch outlets in each. Finally comes the price and terms, and in curt, formal words, a guarantee that the job will be done in a workmanlike manner, etc. This, of course, is all very nice, but the dealer who tried to sell washing machines on such a basis would never have to bother about the poor freight service on the railroads or the many other things which make the machines hard to get nowadays.

When a proposal is presented in the above way the only thing the average householder can understand about it is the price. Regardless of how low the price may seem to the contractor it looks high to the house owner. His first thought, therefore, is, "What are these outlets anyhow, and why do I need so many of them?" and off the list comes the baseboard receptacles and frequently some of the switches.

Making Outlet Necessities Clear to Customers.

If we would pause occasionally to consider the customer's viewpoint on matters of this kind the remedy for the above situation would be obvi-



House-Wiring Plan Used in California That Resulted in Many Contracts for Installation of More Outlets.

ous. There are mighty good reasons for the installation of baseboard outlets, switches, etc., and if the contractor explains these properly in presenting his proposal most people are glad to pay the additional cost to get them. Is it not possible that if a contractor should present his proposals for house wiring on the following basis, they would almost invariably be accepted?

"Dear Mr. Jones: In wiring your residence to enable you to take full advantage of the comforts and conveniences which modern electric lights and appliances afford, we propose to arrange the outlets so that fixtures can be located as follows:

"1. *Porches.* One ceiling outlet on front porch controlled by switch near the door in the hall, and a similar outlet on the back porch controlled by a switch in the kitchen. You will find it quite a safeguard to be able to snap on these lights and observe persons seeking admittance after dark before opening the door. Lighting the porches also makes them safer in bad weather and adds a bright, cheerful appearance when visitors are coming.

"2. *Halls.* One ceiling outlet in the hall on the first floor, and another on the second floor; each outlet controlled by two 3-way switches. These outlets will be so arranged that either light may be turned on or put out from either floor. In entering the front door, for instance, you can press the button, which turns on the light in the downstairs hall. You can then press a second button at the same point, which turns on the light upstairs. After going up you can then turn out either or both lights from the same point on the second floor. You can also reverse this process, turning on the downstairs light from upstairs, etc. You will readily see what a wonderful convenience this arrangement affords when coming home from an evening's entertainment or when it is necessary to go downstairs in the night under emergency circumstances.

"3. *Parlor.* One ceiling outlet in parlor controlled by a switch on the wall, and one baseboard outlet. The ceiling outlet will serve for ordinary lighting of the room, while the baseboard outlet will provide for attaching a floor lamp or a table lamp when desired. It will also provide for a vacuum cleaner.

"4. *Dining Room.* One ceiling outlet in the dining room controlled by a switch on the wall, and one baseboard outlet. The ceiling outlet is for lighting the room. The baseboard outlet is for attaching a percolator or toaster for use on the table. It will be arranged to receive a duplex receptacle, so that two of these devices can be attached at the same time. The baseboard outlet can likewise be used for a vacuum cleaner. The baseboard outlet in the dining room will be connected to the fuse cabinet by an independent circuit, instead of being connected to the same wires which carry the lights. Should anything occur in operating the appliances which cause the fuse to blow, the lights will thus continue to burn instead of going out and plunging the room into darkness, as would otherwise be the case.

"5. *Kitchen.* One ceiling outlet in the kitchen controlled by a switch on the wall and one outlet at chair-rail height for a duplex receptacle. The ceiling outlet will care for the lighting while the duplex receptacle will provide for the use of an electric flatiron as well as for any of the many other electrical helps for household work which can now be purchased.

"6. *Cellar, Laundry, etc.* One ceiling outlet in the cellar controlled by a switch at the top of the stairs; one ceiling outlet in the furnace room controlled by switch on the wall. One ceiling outlet in the laundry controlled by a switch on the wall, together with one outlet for a duplex receptacle, wired from the fuse cabinet by an independent circuit. The duplex receptacle in the laundry will provide for the use of a washing

machine, a mangle, an electric flatiron, etc. By having it on a separate circuit you will be protected against the annoyance of being left in the dark, as explained in the case of the dining-room, should any minor difficulty with any of the appliances cause the fuse to blow. The advantage of controlling the cellar light from the top of the stairs will be obvious and the arrangement proposed for the furnace room likewise requires no comment.

"7. *Bathroom.* One ceiling outlet controlled by a switch on the wall, together with a bracket outlet above the washstand. The ceiling outlet will afford general lighting while the bracket light will provide a convenient light for shaving which you will find a great comfort.

"8. *Bedrooms.* One ceiling outlet controlled by a switch on the wall, and one baseboard outlet for each of the three rooms on the second floor and the two on the third floor. The ceiling outlets will provide for ordinary lighting while those in the baseboard will permit the attachment of table lamps, fan motors, vibrators, vacuum cleaners or any other appliances which you may care to use.

"You will note that in all cases we have proposed switches on the walls to control the various ceiling outlets instead of leaving these to be controlled from the sockets on the fixtures. The wall switches should soon pay for themselves in the reduced breakage of lamps, shades, etc. In addition to this, you will find it much more convenient to locate the wall switches when entering the rooms in the dark than to locate the sockets on the fixtures.

"The price for the complete installation will be $....., payable ..... We can complete the work in.....days after receiving your instructions to proceed.

"Very truly yours,

"BLANK ELECTRIC CO."

With a proposal presented in this way a man's interest is centered on the value he is to receive rather than on the price. In fact, with such a letter at hand his first tendency on receiving a competitive proposal made out in the old style, and quoting a lower price, would be to feel that the second contractor was trying to sell him an inferior article. This, of course, is exactly the sort of feeling that the letter is aimed to produce.

Wonderful progress has been made in the merchandising of electrical appliances, but the matter of wiring has been more or less neglected. This condition does not give a proper balance. There is no reason that electric house wiring, if properly sold, should not yield a reasonable direct profit as well as carrying with it future sales of lamps and appliances. The community needs the service which more wiring makes possible and electrical contractors owe it to themselves and to the industry to apply to this branch of their business the same principles of merchandising which have proved so successful in selling appliances.

The following is the personnel of the Public Utilities Commission of Illinois recently appointed by Gov. Len Small: Frank L. Smith, Dwight, chairman; Cicero J. Lindly, Greenville; Patrick H. Moynihan, Chicago; Hal W. Trovillion, Herrin, and James F. Sullivan, Chicago.

VAST SAVING IN PROPER TREATMENT OF BITUMINOUS COAL.

Opportunity for the Establishment of Community Plants for Producing Smokeless Coal and Marketing Valuable By-Products.

Two billions can be added to the nation's wealth and the smokeless city achieved if coal waste, called mediaeval and inexcusable, is checked by municipalities, according to a statement of the Committee on Information and Service of the American Society of Mechanical Engineers' Fuel Section made public at the Society's headquarters, 29 West 39th street, New York City.

"When American potatoes were first introduced in Europe they were condemned for human use even by church edict," says the statement issued through Walter N. Polakov, chairman of the committee organized to gather information on the energy situation and make it available for the general public.

"The reason for this action," the statement asserts, "was imperfect knowledge of how to cook them. Raw potatoes are unpalatable and dangerous for health. The equally unwholesome and rapacious way of using raw coal has no longer the excuse of imperfect knowledge of technique.

"Advance of engineering science and high prices of domestic and industrial coal and gas challenge the municipalities to put a stop to this mediaeval way of using raw coal. Bituminous coal even of poor grades, can be distilled at low temperature and yield fertilizer and ammonia, benzole, a superior substitute for gasoline, tar, a basis of most of our dyes, medicines, chemicals and perfumes and surplus of gas.

"After these commodities are extracted 1400 lbs. of smokeless, dustless, odorless and tough artificial anthracite are left out of every short ton of raw coal.

"If the 400,000,000 tons of coal annually burned in this country is so treated the following products will be obtained: 1,200,000,000,000 cu. ft. of fuel gas, 4,000,000 tons of ammonia sulphate, 1,000,000,000 gals. crude benzol, 3,600,000,000 gals., tar and 288,000,000 tons of artificial anthracite. The use value of all these commodities will be nearly $4,000,000,000 instead of $2,000,000,000 worth of raw coal. Thus about $2,000,000,000 could be added to our national wealth in the form of wages and profits."

ONE-PASSENGER ELECTRIC VEHICLE.

The SB-Automobil-Gesellschaft m.b.h., Berlin, Germany, is manufacturing a small electric runabout believed to be a novelty in the automobile field. The car is manufactured in only one model, a one-passenger runabout, with a wheel base of 57.12 ins. and a tread of 33.45 ins., and weighs 440 lbs. To this can be attached a 2-wheeled trailer for an additional passenger or for light delivery purposes. Electric current is furnished by two 24-volt lead-plate batteries of six cells each. These require 2.5 kw-hrs. for a full charge, which will drive the car about 35 miles. The electric motor develops about 1.5 hp. and permits of a maximum speed of approximately 13 mi. per hr.

Organizing a Model Contractor-Dealer Business

Three Departments Are Necessarily Those of Finance, Sales and Service, but Finance Is Most Important — Model Establishment Is Outlined for Guidance in Starting a Large or Small Business

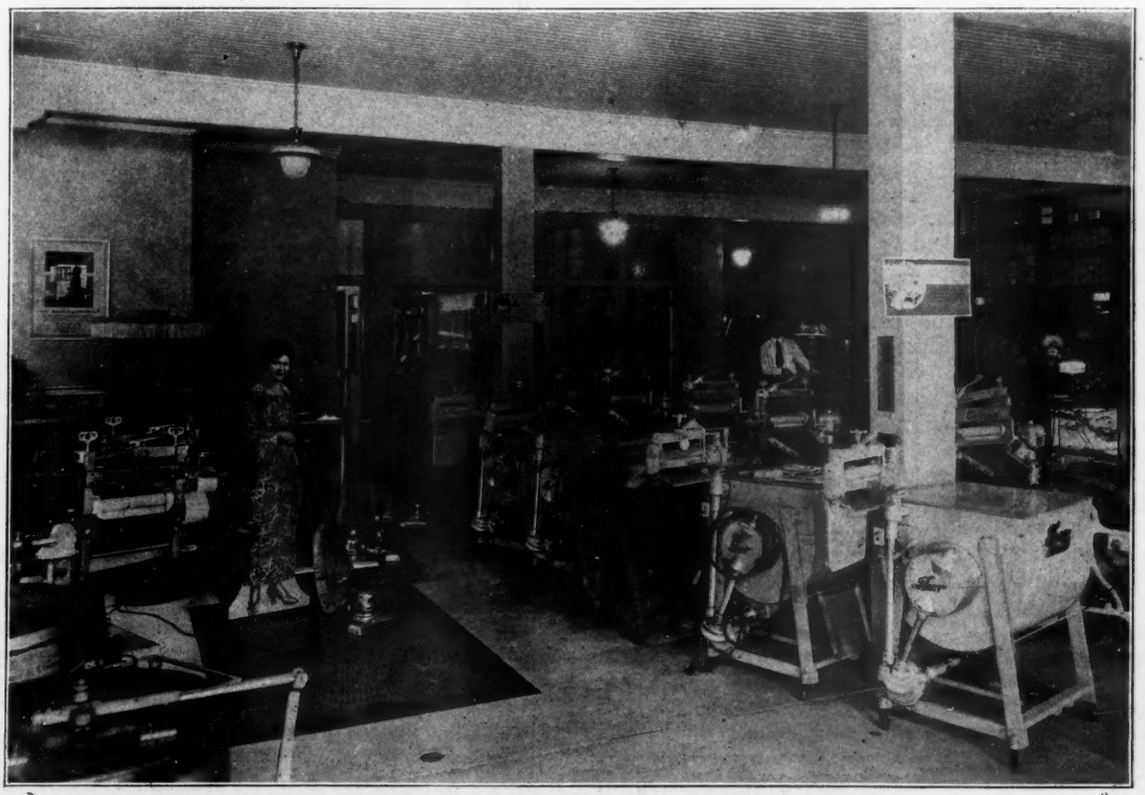
By PAUL C. BURRELL

Secretary and General Manager, Herman Andrae Electrical Co., Milwaukee.

An electrical contracting business falls naturally into three departments; finance, sales, and service. Most electrical contractors have begun their business with the third department. They have felt that they understood their electrical construction and were able to give customers *service*, and upon this have attempted to build up a business. After some years of dabbling in business in this manner they realize that sales are an important end of the business and either organize a sales department, employing salesmen, or devote a certain part of their own time and energies to this particular end of their business.

This represents a business two-thirds complete with both departments distinctly recognized, but we have still paid little or no attention to the first department, or finance. It is only after a business has grown with distinct sales and operating departments to such proportions that questions of finance are forced upon him, that a contractor realizes this as a vital factor of his business. In the beginning he usually carries these matters in his head or in his vest pocket, or on the back of an envelope stuck on a nail near the window, and it is only when he realizes how much he is losing by these methods that he gives careful and distinct attention to the first department of his business, which is finance.

Now, let us look at some of the big businesses of the country and see what attention they pay to the department of finance. Look at a railroad. Does the organization of a railroad begin with its operating crew, its superintendents, conductors and switchmen; does it begin with its sales crew, its ticket choppers, its solicitors, or does it begin in Wall Street with its promoters and its bankers? Look at a manufacturing business. Is the first department to be organized, that of the factory with its superintendents and labor gangs; or the sales crew with the commercial travelers, the sales manager and the advertising manager, or is it Department No. 1? Is the business first conceived by the general manager? Does he first consult the banker and the bond market in planning his business? The more our business grows, the sounder it gets and the better we develop it, the



View of Portion of Sales Floor in Andrae Electrical Store, Milwaukee.

more attention we are going to pay to Department No. 1 of our business—that of finance, or getting and keeping the money on which the entire business is based.

This department of a business has its subdivisions. The two natural sub-divisions are those of getting the money and keeping it. The matter of keeping it is a matter of bookkeeping. The subject of books a contractor should keep will not be discussed here. This will depend entirely upon the nature of his business. This subject includes cost accounting, auditing, paying bills and invoicing.

Outlining Model Business as Basis of Comparison.

The subject outlined in this article is that of *getting the money*, and the first question that naturally arises is, how much is required? Let us set up a model business and work from this. If this business is double yours you will divide the figure by two. If this business is half of yours you will multiply this by two and make a comparison with your own affairs. Contractor-dealers are invited to be frank in criticising these figures, and out of such discussion it is hoped to get a feeling as to whether or not our business is properly founded.

Let us consider a business doing a monthly volume of $10,000. This is at least a 2- or 3-man business. It must have two or three responsible, active partners or managers, as one cannot carry the responsibility for a business of this size without delegating considerable authority to subordinates. This business will have an office force of five or six people outside of two or three who carry the chief burden; it is assumed that this is a diversified business such as our associations, our trade magazines and our jobbers and manufacturers have been encouraging us to develop during the past few years.

This business has a fair proportion of construction work, employs 10 to 20 electricians, conducts a store, canvasses for appliances and serves industrial plants with supplies. It is not a manufacturing business and it is not a jobbing or distributing business. This figure is used because it is a round number, easy to remember and work from, and, it is believed, most closely approximates even the average of our craft, at least the ideal toward which our business points. It is a basis on which the Herman Andrae Electrical Co. operated for quite a number of years. This business amounts to $120,000 a year, or approximately $1,000,000 in 8 yrs.

Let us try to approximate the amount of capital used in this business. We will not assume that the contractor owns the building. This is not the ordinary business practice. We recognize that real estate is entirely distinct from commercial business and we have rented a building under a fairly long lease. This lease should not be so long nor the rent so high as to make the aggregate rental payments run into too considerable proportion of the total net assets of the business. We will say the lease should run from 3 to 5 yrs., and the rental should be in the neighborhood of 1% of the amount of business done.

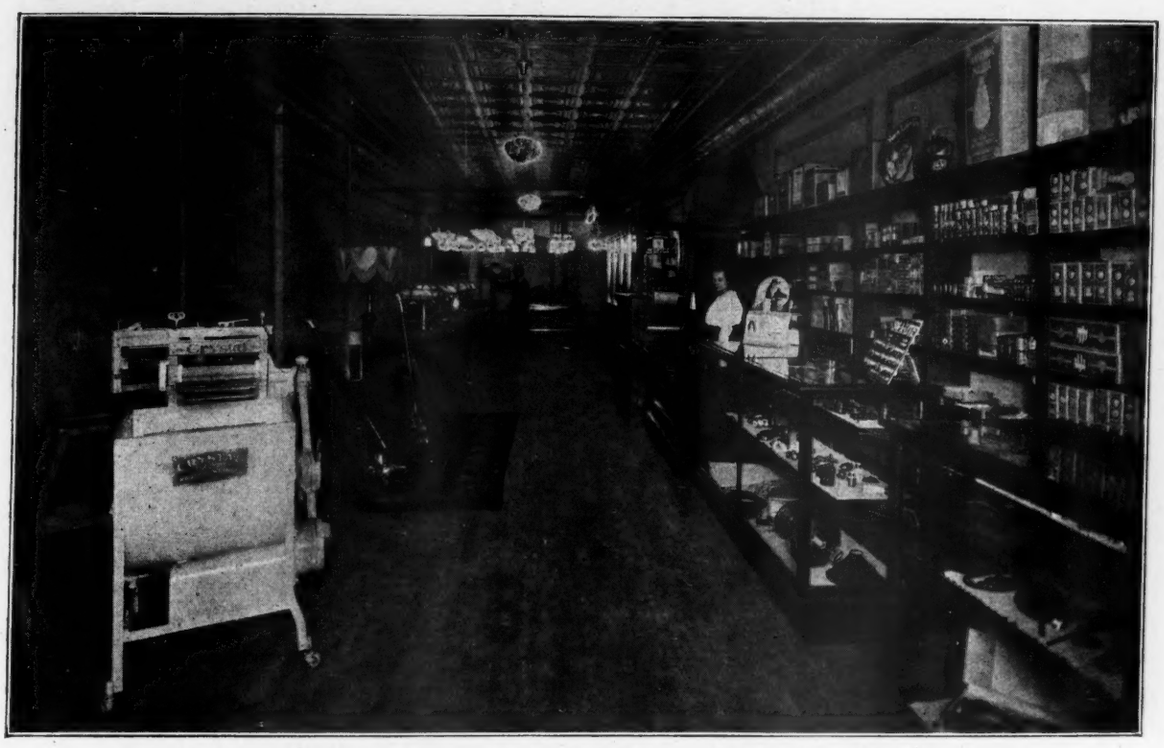
The analysis of costs for an electrical contractor furnished by our National Association of Electrical Contractors and Dealers says that the rental, light, heat and power of a business shall approximate 4% of the volume. Excluding the building, the first item of investment to be covered is for furniture, fixtures, tools, automobiles and other equipment. This will vary a great deal according to the particular nature of the business and its particular location in the city in which it is carried on. Thus a downtown business with emphasis on merchandise sales would run heavier in fixtures and appliances than a business devoted more to construction work and located in an industrial neighborhood where plainer equipment would suffice. Let us provide for this business two or three automobiles at, say, $3000, and office furniture and other equipment at $4000.

Consideration of Prices and Discounts in Selecting Stock.

The second thing to be provided is merchandise. The amount and value of this merchandise is going to vary with business conditions. It is going to be necessary to carry more in times such as we have had during the past 3 yrs., when we could not depend upon our jobbers and manufacturers to furnish us with material immediately. In normal times when these organizations are performing their functions properly our stock can be reduced. A contractor should never attempt to speculate in material, buying a year's supply because he thinks the price is going to go up, or because the salesman tempts him with a little longer discount. If he attempts either of these he is invading a field entirely distinct from construction and merchandising. He is becoming in a small way a jobber and an investor. He should not attempt this until he has a definite fund for such a purpose and can consider that, with a certain proportion of his capital, he is speculating.

The main question in providing a certain amount of merchandise is turnover. We have heard a good deal of this in the past few months and the merchant who can get a turnover in 30 days is going to be more successful than the merchant who takes 180. It is not admitted that turnover can increase materially the amount of business done by the contractor. There is in every community a certain amount of business for each man and intensive sales or advertising is not alone going to enable him to double his volume of billing and thus cut his turnover in two. It is contended, rather, that the amount of business as fixing turnover is a question of reducing stock. Dealers generally will find their business to be between the 30 and the 180-day basis, but most of us probably are nearer to taking 6 mo. to turn stock than 30 days. While we may expect to get our business on a 60-day basis, in providing funds to operate a new business a good plan is to estimate your requirements and then double.

We won't go quite that far in this case, but we will assume that our contractor-dealer is going to turn his stock over in 90 days or 3 mo. This means that if his sales are $10,000 a month, and half of his total cost is merchandise—which is a close approximation—he will have an inventory of $15,000. This is the figure to be used in this connection. Particular attention of contractor-dealers is invited to criticism of this figure. It is believed they can do better. Will the dealer please analyze his own business and see if his inventory of merchandise on hand does not run



Interior View of Salesroom in Small Neighborhood Store With Thriving Trade in Chicago.

close to one and one-half times his monthly billing?

The third item of investment may be charged to "office overhead" or uncompleted business in the accounting department involving the contracts which have been completed and have not yet been billed. The contractor's capital is tied up, the customer has not had notice of his obligation and has not paid for it. It is to be doubted if many contractors can keep their average under a half month's work. This 15 days as the basis of delay in billing this will add to our investment for this item $5000.

The fourth item of investment is accounts receivable. This does not include accounts which have been settled by notes but merely the open accounts on the books. Again the nature of a business is a factor of the amount we are going to use. If we have a greater number of time-payment contracts the proportion is going to be increased. It is not safe to figure on less than 60-days' business being on the books. In our own organization we have for the past year held this figure between 45 and 55 days, but to be safe let us use 60-days' business here, or $20,000.

Summary of Items of $50,000 Initial Investment.

Now, we have covered the biggest part of our investment. We have a total of $47,000. There are going to be other small items, such as insurance paid in advance, rent where our payments average 15 days in advance; but all of these are insignificant compared to the four items above, so we can safely admit that business should be operated on a net investment of $50,000 or a 5-mo. turnover. This is close to the average as observed in our own business. It has been bettered the greater part of the time, and most contractor-dealers can better it by careful attention to turnover or collections, which are the most important factors in financing a business.

Turnovers or collections represent $35,000 out of the total $50,000, and a man should see the whole of this $50,000 before he plans his business. There is a little of this which can be distributed, and which is a natural deduction. Most of our merchandise can be discounted if we settle at regular dates, so that the 10-day period can in general be extended to 20 days. Twenty days' merchandise purchases amounts to $3000 which the wholesaler will be glad to carry. Your payroll ledger will, if you settle on Tuesday night for the previous week's work, amount to an average of 4 days, which your employes are carrying. This will be $500, but these two amounts should hardly be used to reduce the amount of working capital we should provide. This should rather be left in a bank balance. They should be so left if we expect to operate this business on a much smaller capital than we indicated above, and borrow the balance from the bank.

Confiding in Banker and Jobber.

The man who reaches this point in his business and has analyzed his investment carefully, has a problem before him. We will say that he has $20,000. Is it safe for him to embark on such a scheme as this, or business of this size? Not unless he has the full confidence of his banker and his jobber. He has not a sufficient margin on which to operate, and under these conditions he should go frankly to the banker and show what his net assets are and consult with him on such matters as he can, telling him at the same time how much he expects the jobber to carry. He should make the same sort of an arrangement with his jobbers, and if he expects to buy on longer time and not discount his bills he should have definite agreements to this effect with all

from whom he buys. Otherwise the seller will expect to have his bills discounted and the contractor's credit rating is going to suffer.

Arrangement of Credits in Lieu of Adequate Cash Capital.

The ideal way, of course, is to have on hand the full $50,000 to operate this business. With 50% of this amount the contractor is going to be in difficulties all the time. To meet his bills he must ask his creditors to wait 60 days. He must borrow a larger amount than the banks really want to carry, but in case he is operating on this basis he will probably make some such arrangement as follows: He will borrow from the bank $10,000, either on demand notes or on 90-day notes maturing from time to time, and he will settle with his principal jobber for a certain line of credit and ask him to carry his notes for from 60 to 90 days, settling his invoices, however, when due. In this way the jobber will cover an additional $15,000 of his deficit. These figures are both more than the banker and the jobber will willingly grant, but these should be the only two persons asked to carry the balance that the contractor does not carry himself. If the contractor has $35,000 and can reduce these figures to $7000 or $8000 each, he is going to get a much more ready response from both.

There are three more branches of this subject deserving special consideration. They are the questions of investing employes, of time-payment contracts and of overhead. Some contractors have made arrangements with certain of their employes to take stock in their organization. This has two advantages. The first is that it increases the net assets of the organization and decreases the amount of money which it is necessary to ask the banker and the jobber to carry, providing the owner is not in position to finance his business alone. The second advantage is probably greater, and that is, the employe feels an interest in the business and will assist in stopping those leaks which the owner himself cannot look after.

Now, time-payment sales. If we go deeply into these sales alone, the fourth item in our analysis, accounts receivable, is going to be increased from 60 to probably 180 days, depending upon the length of time we permit our time-payment contracts to run. If we sell a washer for $185 at $15 down and $10 a month, it is going to take the customer 18 mo. to pay out, and on an average his accounts are going to be owing 9 mo. Our smaller sales can probably be completed in a shorter time but experience shows that even a 10-mo. vacuum-cleaner contract usually lags a month before it is closed up. We can thus expect this business to average at most 6 mo.

If the model $10,000 monthly business were all appliances it would mean that accounts receivable would approximate $60,000, and the total investment $90,000. This means a much larger initial investment or a much longer line of credit. It is not believed you will find it economy to turn these accounts over to the banks who make a principal business of carrying them. They will only loan you in the neighborhood of 70% of the value of these accounts and tie you up pretty strongly with bonds and other conditions, and make you finally responsible for the collection in the end. If you figure right down to a sharp point they are getting between 18 and 23% for the use of their money, and no business man can afford to pay this rate.

In this respect the department stores are getting the best of us. If a contractor sets out to do a big appliance business it is going to require so much money to carry his accounts that he soon becomes involved, but the department stores with net assets of a million or more can easily go to the bank and borrow on their general account $100,000 or $200,000, sell stocks or raise the money in other ways, and can carry this business without feeling it.

A dealer going into this business should have his eyes open. If he stops to realize that every time he sells a washer for $157.50 and the customer pays $15 down, he must invest $125 by paying the jobber $110 for that washer and the salesman $15 for selling it. He gets $15 back and carries $110 on the books. He naturally thinks the only way to make this up is to go out and sell another washer, but when these charges go to the bookkeeper this gentleman reports that the house is another $110 on the ledger and this merry circle keeps on until, whether he knows it or not, the contractor begins to get tired of the entire business. The big department stores do not feel this so long as it is only a small feature of their business, but the dealer feels it at once when he begins to make time-payment sales the big end of his organization. Our manufacturers tell us that careful analysis shows it costs $5 to carry a vacuum-cleaner account over 10 mo. That covers interest, bookkeeping, postage, printing and other expenses. These figures are arrived at after spending more than $1000 for expert accounting service. They cost you nothing. Now, how long are we going to continue to give this service away for $2.50, or carry time payments with a 5% reduction?

There is one important feature to be considered in relation to overhead expense and that is, the volume of your business should be worked out closely in connection with your organization and quarters. If you have too big an organization and too large a building and cannot keep it filled up with business, your overhead expense is going to be too high. As you increase the volume of business certain fixed expenses are going to remain stationary, and your percentage of overhead is going to decrease until you reach the point where your business just nicely fills your building and loads your organization.

When you attempt, however, to do still more business with the same building and the same organization, your percentage of overhead is going to go up again because your clerks are going to get into each other's way, your salesmen are going to interfere with each other, your construction crew is going to stand around waiting for material and you are going to have untold leaks that are not accounted for.

There is a certain happy medium between the volume of business and the size of your organization which must be maintained in order to get the most efficient results. It does not pay to undertake too much business if you haven't the right personnel to handle it, any more than it pays to have too large an organization and not enough business to carry the overhead.

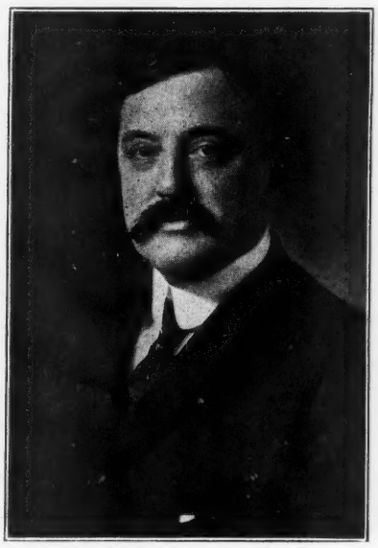
National Association of Electrical Contractor-Dealers

Purposes and Plans of the Organization for Betterment of Conditions Pertaining to Wiring and Merchandising — Method of Selecting Executive Committee and Activities of Subcommittees

By A. PENN DENTON

Member of Executive Committee, National Association of Electrical Contractors and Dealers.

At the New Orleans Convention of the National Association of Electrical Contractors and Dealers in 1917, William L. Goodwin gave us a new program of activity. He gave us a real constructive program to follow which in its study and working out has certainly broadened the horizon of the electrical contractor-dealer, and after 3 yrs. of conscientious and constructive work your officers have with the assistance of our membership placed the Association on a footing today that is comparable to many of the largest and most successful trade organizations in this country.



James R. Strong.
President National Association Electrical Contractors and Dealers.

The reorganization of our National Association gave us first of all a much smaller and more effective National Executive Committee. Instead of a large committee of directors, where one or two members were sent by states from all over the country, the Executive Committee was cut down to 19 members, six representing the Eastern Division, six the Central Division, two the Western Division, two from Canada and three at large.

Each member of the Executive Committee is made responsible for one department of our national work. The chairman of the Association does not assume the responsibility for any one department of the work but supervises the work of all committees, while the general manager receives all communications from the membership to the Executive Committee and in turn refers them to this body.

Method of Selecting Chairman and Members of Executive Committee.

The plan of electing members of the Executive Committee provides that three from both the Eastern and Central Divisions, one from the Western Division and one from Canada are elected in the fall of each year to hold office for 2 yrs. At the annual meeting of the Executive Committee in January of each year the National Association chairman is elected for 1 yr., at which time the three members at large are also elected for 1 yr. This information is given because so many members do not seem to understand the plan of electing officers.

Work of the individual committee chairmen is checked up by the National chairman during the year and all subcommittees receive the approval of the National chairman before confirmation of their appointment by individual members of the Executive Committee. All matters which members desire to refer to the Executive Committee should be addressed to the general manager, W. H. Morton. He in turn will refer them to the proper committee. Work of the individual committees throughout the year is submitted in written form at the two Executive Committee meetings in January and in the fall. The decision of the entire Executive Committee is necessary as to the action to be taken on matters of importance by the National Association.

Review of Committees and Work Delegated to Each of Them.

Let us briefly review the committees and the work they are now actively engaged in. Our Architects' Committee is at work this year with certain matters which the American Institute of Architects has referred to it. Although this committee is not as active as some of the others, it is in constant touch with the Association office and, through General Manager Morton, keeps our Association in working agreement with the A. I. A.

Our Central-Station Committee has had a number of meetings during the past year with a group committee of the National Electric Light Association where matters of interest affecting relations to the contractor-dealer with central-station companies have been discussed. These discussions have resulted in recommendations being forwarded through N. E. L. A. channels to the central-station companies throughout the country which should assist the co-operative work of contractor-dealers in different localities. The Central-Station Committee is at this time trying to

arrange a working plan with the National Electric Light Association whereby the problems that come up in any city between the contractor-dealer and central-station company can receive help from the Central-Station Committee upon request of the contractor-dealer in writing to the National Association office.

Everyone is familiar with the work of the Convention and Meetings Committee whose time is devoted to continuous preparation for the coming annual convention, to be held this year in Buffalo, July 18-23.

Work of the Cost-Data Committee during the past 2 yrs. has given our membership some very helpful information. It was through this committee that the Estimators' Club, of Chicago, carried on its work, and the Association issued its bulletin on estimating. This committee is now engaged in working out some more cost-data figures to be given the membership from time to time.

The Credit and Accounting Committte has been one of the Association's most active committees for a number of years. It has been due to the efforts of this committee, with the aid of General Manager Morton, that our membership has been provided with one of the best systems of accounting and bookkeeping in existence. In addition, this committee has ready for distribution a simple business record for small concerns that do not keep a complete set of books. It will pay any member who does not employ a bookkeeper to investigate the merits of this new business record.

Efforts of Labor Committee Directed Toward Open-Shop Policy.

One of the most important features of the Association is the Labor Committee. It is also probably the least known among the membership. This committee is in a position to help contractors in the various cities with the solution of problems involving organized and unorganized labor. It has been the policy of this committee to in no wise affect the policy of any contractor-dealer as to his maintenance of a closed or open shop. It is possible, however, that if electrical contractors' organizations, in their local dealings with union labor, would refer proposed contracts to the Labor Committee of our Association before closing with the local I. B. E. W., they would receive valuable help that would enable them to keep out of such contracts many rules which are purely arbitrary and of a local nature, put in by the I. B. E. W. to make their locality just a little more strongly organized than some other. Our National Association is in every way committed to an open-shop plan of conducting business and the members can greatly assist the work of the Labor Committee by sending in the results of their local negotiations.

Our Legislation Committee is at present engaged in collecting data to be used in formulating a uniform state law for the licensing of contractor-dealers which will be as near as possible a model of its kind. It should be acceptable for use in any state. The Liability Insurance Committee has so widely published its work that no explanation of its activities is necessary.

Work of the Membership Committee is being ably handled. It is through the efforts of this committee that our traveling representative, Laurence W. Davis has been employed to work with the membership throughout the country in the enlistment of new members. Mr. Davis was employed a year ago in January and last year saw a much larger increase in the membership than during any previous year in the history of the Association. Mr. Davis is now making a 3-mo. tour extending throughout the West and South, the returns from which are most encouraging. It is the hope of the Executive Committee that this year will see our membership doubled.

Work of Other Committees Brings Substantial Results.

The Standardization Committee is constantly at work bringing about a more uniform and simpler line of electrical wiring devices. At this time it is particularly active in getting the manufacturers of the major household electrical appliances to standardize their products where possible. In the matter of attachment plugs and similar devices there has been much improvement in standardization among manufacturers during the past year.

One of the most useful and active committees is the Committee on the Universal Data and Sales Book. The manner in which this book has been kept up-to-date during the past 2 yrs., particularly during the time when prices were fluctuating nearly every week, is the best evidence that the chairman of this committee is successfully doing work for the benefit of the membership.

We have our Chamber of Commerce Committee, with a membership in the U. S. Chamber of Commerce that attends every important meeting of that body. We have contributed our proportionate share toward the building of the new home of the U. S. Chamber of Commerce in Washington, D. C. The chairman of this committee has found that our co-operation in this matter has meant much to our Association in its broad work.

We have at this time a Trade Policy Committee composed of our Committees on Jobbers, Manufacturers, Central Stations, Merchandising and Industrial Development. This committee is now working on the matter of better margins for contractor-dealers. This is one of the most important subjects under investigation and the committee hopes, as does the entire membership, that a plan will be worked out with the manufacturers and jobbers by which the dealers in electrical appliances will be given better trade protection than they are now getting. As all contractor-members know, the Code Committee is constantly in co-operation with similar committees of other electrical associations in the matter of revision of electrical wiring rules.

The work of the National office and of the Executive Committee should always be of interest to our membership at large. The problems that the Association encounters can be best solved when we receive ready and full support from the membership of the local and state organizations. We need the constructive criticism of our members to assist us in the accomplishment of our work. We cannot solve all of the National problems alone, therefore, Mr. Morton's office and the Executive Committee welcome at all times helpful suggestions from members.

Who's Who in Framing National Electrical Rules

Evolution of Remarkable Code That Has Made Electricity the Safest and Most Economic Energy Known to Man — Associations Co-operating in Perfection of the National Electrical Code

By GEORGE B. MULDAUR
General Agent, Underwriters' Laboratories.

Without going into boring details with a mass of statistics your attention will be called to the well-worn statement that this country is losing by fire annually $350,000,000. There is an average of one fire every minute day and night the year 'round.

The U. S. Geological Survey computed some years ago that the total fire loss in the country equaled the entire amount of gold, silver, copper and petroleum produced. Of this loss it is agreed that 7% is due to fires of electrical origin—about $24,000,000; not a large proportion of the whole, and, in fact, reflecting great credit upon the electrical industry in view of its enormous size and importance in everyday life, but still too much.

The leaders of electrical progress have been second to none in untiring efforts toward the perfecting of means to make electrical devices, apparatus and methods safe to handle and trustworthy in use. Not many years ago electric utensils were looked upon askance. They were dangerous; they were experimental; each manufacturer worked according to his own lights—and often his lights were pretty dim.

What has changed all this? Nothing so much as that remarkable document known as the National Electrical Code and the enormous amount of educational research work that went toward this compilation. And note this: The reason that electricity is today the safest form of energy known to man is due to the fact that the men whose lives are devoted to its interests are the most highly trained in their specialty of any group of industrial workers. In other words, they are educated men. They do not work by rule of thumb; they know what they are about, and the reason they know what they are about is because at their command is the most complete and comprehensive mass of literature ever gotten together on one subject in the same space of time.

Classification of Interests Involved in Making Electrical Code.

Even that would not have served the purpose alone: It's too vast to read—too comprehensive for the average digestion. And so the National Electrical Code came into existence—a strong, simple document that any one can understand. But the rules that make the Code what it is; where do they come from? Perhaps it would be simpler to say, where do they not come from? At any rate, it is the purpose of this article to put before you an outline of the service performed by the various learned societies and organizations that have contributed and are constantly contributing to the perfecting of safety rules for your guidance and for the betterment of the industry.

Broadly, these organizations may be separated into three divisions—general, fire and accident—but as in almost every case the affiliations of each society include members of one or both of the other groups you will find in the end that they comprise one big family, each member working along some particular line, but glad to exchange advice and help when needed with all other members. The whole may be likened to a huge university, comprising all fields of learning and giving freely of its knowledge from any one of its almost countless schools. For convenience the following basic division is made:

Societies.

General.

American Institute of Electrical Engineers.
American Engineering Standards Committee.
National Electric Light Association.
American Society for Testing Materials.
Electric Power Club.
Electrical Manufacturers' Council.
National Association of Electrical Contractors and Dealers.
American Institute of Architects.
Associated Manufacturers of Electrical Supplies.

Fire.

Fire Insurance Companies.
National Board of Fire Underwriters.
Inspection Departments.
National Fire Protection Association.
Underwriters' Laboratories.

Accident.

Casualty and Liability Companies.
National Workmen's Compensation Service Bureau.
National Safety Council.
Inspection Departments, Insurance, Municipal and State.
Electrical Safety Conference.
Bureau of Standards.
Bureau of Mines.
Underwriters' Laboratories.

There are many others, of course, but these are selected because of their prominence in the formulation of electrical rules.

It is not intended to go fully into the matter of the interlocking of these societies. The interdependence of some of them will be recognized at a glance. But a few instances will be interesting as indicating the extent of their co-operation and the bewildering mass of information required by any one who seeks to keep in touch with all their activities.

Contractors are familiar with the Standardiza-

tion Rules of the A. I. E. E. How were these rules compiled? The layman might suppose that the prestige of this society was sufficient of itself to warrant the promulgation of electrical rules without going outside of its own ranks. As a matter of fact the institute acknowledges, in the preparation of these rules, the co-operation of the following:

American Society for Testing Materials.
Association of Edison Illuminating Companies.
Illuminating Engineering Society.
Electric Power Club.
National Electric Light Association—Committees on Meters and Apparatus.
Association of Railway Electrical Engineers.
American Electrical Railway Engineering Association.
Institute of Radio Engineers.
Society of Automobile Engineers.
Railway Signal Association.

Ten national technical associations were called into conference in addition to the array of experts represented by the membership of the institute itself, to prepare these rules for electrical contractors.

Again, the American Engineering Standards Committee, one of the most remarkable scientific associations in this or any other country, is composed entirely of specially selected representatives of the leading technical organizations. Its original board was composed of three members each of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Society for Testing Materials, and the U. S. Departments of War, Navy and Commerce.

Its present membership includes nearly all of the recognized bodies whose work is in any way directed to the formulation of rules and standards in any scientific or industrial field.

The recently issued "Safety Rules for Industrial Control Equipment," published by the Electrical Safety Conference, were the result of collaboration with the Associated Manufacturers of Electrical Supplies, Bureau of Standards, Electric Power Club, National Workmen's Compensation Service Bureau, and Underwriters' Laboratories.

The first object of the Conference is "To promote by co-operative effort the orderly, consistent and proper development of practice in electrical manufacturing and installations with regard to accident hazards."

The same spirit of co-operation extends throughout the whole list of institutes, societies, associations, committees, groups, and individuals responsible for the electrical rules. The National Fire Protection Association, for instance, has among its membership some 80 societies and associations, many of which in turn are composed of groups of associations and societies which are themselves component parts of still other organizations.

Centralization of Research Work and Electrical Data.

Stress has been laid on the apparent confusion, the embarrassment of riches, presented by the great number of active societies in the field in order, first, to point out the difficulty presented to the man who tries to discriminate among them with a view to securing any particular bit of information and, second, having become convinced of the hopelessness of his case, to provide a way out of the difficulty with neatness and despatch.

A question of importance develops; a matter of electrical rules, let us say, is in dispute. The answer may be a simple one of yes or no, or it may involve research and investigation. The data is all available somewhere, but where? Have busy men time to hunt and grope among the mass of literature relating to the general subject for that particular instance. They have not. If they write to one of the societies the chances are greatly against guessing the right one first and much time will inevitably be lost before the facts are run to earth—if they ever are.

The answer is: Don't try. Ask Underwriters' Laboratories. Don't think these laboratories simply exist for the purpose of testing materials. Their motto is: "For Service—Not Profit." And when we say service, we mean *service*. I am speaking for every member of the organization and voicing the personal statement of Mr. Merrill, the president, when I say that one of the chief functions and most valued privileges of Underwriters' Laboratories is giving free information concerning all matters within their scope. So great a part do the laboratories play in the field of rules and standards, electrical and otherwise, and so little does the public realize the full extent of its service and the methods by which they are brought about, that a concise account of this remarkable organization is appropriate here.

Organization and Purposes of the Underwriters' Laboratories.

Underwriters' Laboratories, Inc., is the technical school of the university of fire and accident prevention. Education is the one underlying and essential element in the fight against the nation's appalling loss of life and property from fire and accident, and the laboratories afford means of studying machinery, devices and apparatus in their relation exclusively to safety.

From small beginnings, as a wire testing shop established by W. H. Merrill in 1893, the laboratories have grown under his leadership to their present world-wide importance with a headquarters staff of 145 and agencies in 131 cities in the United States and Canada. In 1901 they were incorporated under the auspices of the National Board of Fire Underwriters, whose financial backing enabled the management to secure proper buildings, equipment, and staff and to lay out a plan of action which has made them self-supporting.

The basic principle of the laboratories is: Service—not Profit. While a fee is charged manufacturers submitting materials for test, this is so graded as to cover the actual cost, plus a small percentage for maintenance only, and is not a factor in the selling price. No one receives a dividend. The laboratories do no consulting or commercial work and are not in competition with any technical, scientific or engineering organization. Their sole function is to secure and disseminate information regarding the fitness of the devices inspected for the uses to which they will be put. They establish a safe minimum of ex-

cellence and make no attempt to discriminate among such articles as exceed that minimum.

The main offices and testing plant occupy a 3-story building at 207 East Ohio street, Chicago. It has a frontage of 266 ft., a floor area of upward of 50,000 sq. ft., and is perhaps the best example of fire resistive construction in existence. It is built wholly of brick, terra cotta, stone, concrete and steel, and is equipped throughout with steel furniture, cabinets and filing cases. Only the chairs are of wood and there are no rugs or curtains. All trim is of metal and the windows are of wire glass. Although there is nothing in the building to burn, a complete automatic sprinkler system and a fire extinguisher equipment are provided, and fire doors are placed on all floors where they would be required under ordinary conditions. The building is intended to serve as an object lesson and a model in modern fireproof construction. The public is encouraged to inspect it at all times.

In order to show that safety and beauty may go hand in hand, especial care has been given to the selection of the material used for interior finish. Warm-toned tapestry brick, tile and terra cotta are combined so artistically that the offices compare favorably with the best in comfort, dignity and architectural beauty.

Wonders of the Testing Department for Ponderous Materials.

The second floor is given over to the private offices of the executives and to the general administration. On the third floor are the chemical and electrical laboratories, the casualty and automotive department, the drafting room and certain special research laboratories. The ground floor and the court contain the heavy machinery, furnaces, machine shops and tools for an endless variety of tests. The ponderous column testing machine in which a column of steel, concrete, wood or iron is subjected to hydraulic pressure equivalent to anything it could conceivably bear in practice, and at the same time to direct flames paralleling actual conflagration conditions, is one of the most interesting. Instruments of precision record the exact pressure, heat and deflection up to the point of failure. Safes are heated in a specially designed gas furnace for a given number of hours and, while at their greatest heat, are hoisted to the height of a 3-story building and dropped on a pile of brick. If the contents, consisting of books and papers, are unharmed by this treatment, the test is considered satisfactory.

Flooring and roofing materials are tested for fire resistive qualities in a variety of ways. Wire-glass windows, automatic fire doors, fire walls and refractory materials are tested by fire, and, while hot, are deluged with water from a fire hose. Everything is given the treatment it would get under the most severe conditions of actual service. The equipment ranges from giant presses and tensile machines to the miniature pile driver used to test the force necessary to ignite a match. The hydraulic equipment is particularly complete, as hose, sprinkler systems and valves form an important part of the daily run of tests in this department of the institution.

There is also a branch laboratory at 25 City Hall place, New York City, where electrical tests are carried out under the direction of Dana Pierce, resident vice-president, and a staff of engineers and inspectors.

The casualty department takes care of all devices relating to industrial accident hazard, machinery guards and safety appliances, and the recently organized automobile department is concerned with items of collision, theft and fire.

Co-operation with the recognized organizations having jurisdiction over each class of work is a feature of the laboratories' operations. Arrangements also exist with the Federal Government through the Bureau of Standards and the Bureau of Mines whereby technical matters in controversy may be submitted to either bureau for arbitration.

Devices submitted to the laboratories for listing are first tested by the engineers in charge of the special class of work to which they apply. The standards to which such devices must attain to receive approval are not arbitrary, nor are they the result of the laboratories' researches alone. They are determined by the best recognized practice and in consultation with so-called industry conferences appointed from the most prominent experts in their special fields. An important feature of the laboratories' service is the advice and assistance they are enabled to give to manufacturers in perfecting devices shown by the preliminary tests to be substandard.

When a favorable report has been rendered by the engineers of tests it is not yet ready to issue, but is first submitted to one of four councils—Fire, Casualty, Electrical or Automobile—for confirmation, amendment or rejection by letter ballot. The total of the council memberships is 115. The councils are composed of experts, scientists, engineers and insurance officials having no connection with any manufacturing or merchandising organization. If the vote of the council is favorable, the device passes into the class of listed articles. A summary of the report is printed on a card which is filed with others according to classification. Cabinets containing these card systems are maintained in the offices of the principal boards of underwriters and inspection bureaus throughout the country, as well as by many public and private organizations, Government, State and municipal departments.

Lists of inspected appliances are also freely distributed to persons interested, especially to builders and building owners, architects, electrical contractors—every one, in short, who has the selection of materials, machinery or devices bearing upon safety of property and life. The laboratories' lists eliminate chance and place in the hands of responsible persons a certain means of determining what is worthy of confidence. The listing of any device is in itself a favorable report reduced to its lowest terms. Should the complete report be required it may be had by persons showing a proper reason for asking it.

Value of Inspection and Re-examination Service to the Public.

In order that any device once passed and listed shall be known to maintain the standard of excellence certified by the laboratories' favorable action, three forms of follow-up service have been adopted, any one of which may be selected by the manufacturer. The oldest of these, Re-examination Service, consists of tests made from time to

time of samples obtained in the open market by the laboratories' representatives. The manufacturer is advised of any finding that indicates deterioration and is given an opportunity to make corrections. Should these tests show that the device is in danger of becoming substandard, approval is withheld until the original excellence is re-established.

Inspection Service, the second form of follow-up, comprises tests made by the laboratories' engineers at the factory during manufacture. The results are the same as in the Re-examination Service, but the plant is considered somewhat more effective as coming closer to the source of supply and tending to correct deviations from the normal more promptly.

The third and best follow-up plan thus devised is the Label Service. This, as the name implies, consists simply of affixing the laboratories' label at the factory to such goods as are shown to be standard by the tests of the laboratories' engineers on the spot. The labels are recognized wherever found and afford an instant proof of excellence. A check is kept by constant additional tests of labeled articles bought in the open market and sent in by inspectors.

So satisfactory, both to manufacturer and user, has the Label Service become that upwards of 100,000,000 labels were issued during the past year, and it is customary to consider the label a passport requiring no further investigation. It is recognized by inspection bureaus and boards having jurisdiction over the selection and use of materials and appliances relating to safety from fire and accident, not because of any authority or guarantee of recognition on the laboratories' part, but solely owing to the reputation built up and sustained for upward of 25 yrs. There is truth in the lyrical slogan, "Look for the label and you can't go wrong!"

This organization is at the service of every contractor-dealer. It is here for their benefit. It is able to take many burdens off their hands and will be glad to do it. The laboratories, it is safe to say, have facilities for correctly answering any questions one can ask, and they welcome the opportunity of so doing. Don't bother about where to go for any particular piece of information; when in doubt, ask the laboratories. Letters containing such requests may be addressed to the general agent. They will then automatically go through the proper channels and be promptly attended to.

In return they ask co-operation of contractor-dealers, who know their work and what the label means. Give it the recognition it deserves. Use listed and labeled material. Tell others about it. We are all of us engaged in a big work—bigger and beset with more perplexing problems now than at any former time. Let's work together. We all need help. No one is worth much by himself, but we are all worth just as much as the sum of all our efforts when we all pull in the same direction.

We live by rules of our own making, or at least of our own choosing. There are trying times ahead and we shall come through them more or less bent, perhaps, but unbroken. Let us play the game according to the rules irrespective of who's who, remembering that the Golden Rule is the first and greatest of them all.

MINING LAWS ON USE OF ELECTRICITY IN COAL MINES.

Thirty of our states have coal mines, and 28 have regulations prepared by commissions or have passed laws governing the operation of coal mines. The codes may be grouped as follows: Twelve that are distinctly coal mining; 8 that are essentially coal mining, but also apply to other mines; 5 that refer partly to coal mines, and 4 that are essentially metal mining, but apply in whole or in part to coal mining. Pennsylvania has separate codes for the anthracite and bituminous fields. It was the first state to have a coal-mining law of any kind, in 1869. By 1890, 13 states had coal-mining statutes. Before that year, electricity was little used in mines, and these early codes contain practically no provisions regulating its use. Since that date, however, the application of electricity has made such progress that now there is hardly a task or operation connected with coal mining that is not directly or indirectly concerned with electricity—for example, lighting, drilling, undercutting, shot firing, hauling, hoisting, signalling, and pumping.

Most of the mining codes have been changed by amendment or complete revision, and now 21 states make some reference in their coal-mining codes to the use of electricity. The rapidity with which electrical equipment has entered into the many phases of mining has greatly exceeded the advance of regulations governing its use. Even the best electrical mining codes in force need modernizing, and some states have even neglected to mention the use of electricity in their mining laws.

Electrical equipment for mines, in order to be safe and efficient, must be properly designed, carefully installed, inspected at regular intervals by competent men, and maintained in good working condition. In general, the best way to obtain satisfactory electrical equipment for mine service, and to insure its proper installation, inspection, and maintenance, is for each coal-mining state to make and enforce fundamental rules and regulations relating to the use of electricity and electrical equipment in and about coal mines of that state.

The U. S. Bureau of Mines has recently issued Technical Paper 271, "Mining Laws on Use of Electricity in Coal Mines" by L. C. Ilsley, electrical engineer of the bureau. This report, which presents the results of a study of the different state codes, has a three-fold purpose—to show by comparison the relative attention given by law-making bodies of the different states to the safe use of electricity in coal mines; to list and explain the object of the more important regulations, and to cite examples of regulations now in effect.

The laws or rules relating to electricity are in this report grouped under three main heads; (I), Rules relating to general safety in use of electricity underground; (II), rules relating to underground electrical apparatus; (III), rules relating to underground circuits.

There are so many ways of giving service that it would be a hopeless task to attempt to enumerate them all. The contractor can render valuable advice to his customer by showing how things can be made better.

Fundamental Principles of A-C. Motor Controllers

Tenth of a Series of Articles on Principles and Application of Motor-Control Apparatus—Theory and Practice in Connection With Controllers for Induction, Synchronous and Commutator-Type Motors

By G. J. KIRKGASSER and E. W. SEEGER

General.—The fundamental principles of controllers for accelerating and regulating the speed of alternating-current motors are not the same as those applying to direct-current motors because the inherent characteristics of the several types of alternating-current motors differ widely from each other and from those of direct-current motors. All types of direct-current motors are subject to speed regulation over a wide range and by small variations, while some types of alternating-current motors are inherently constant-speed machines, some are limited variable-speed machines with fixed maximum speeds, and other types have speed ranges corresponding to those of direct-current machines.

The starting and speed control of direct-current motors is accomplished by varying the amount of external resistance in the motor circuits, but this general rule does not apply to alternating-current motors. For example, there are some types of small alternating-current motors that can be connected directly to an energy supply or line circuit without providing any means for reducing the current during the starting period. Various types of equipment, both manual and automatic in operation, are available for this purpose. It is common practice to start squirrel-cage motors in sizes up to 5 and even 7.5 hp., when lightly loaded, by means of quick make-and-break switches. Since there are no commutators to cause sparking the comparatively large amount of current during the starting period does no material damage to the motors.

Nearly all single-phase motors are started by connecting them directly to the energy supply circuit, although in the larger sizes the initial current may be so great that it is necessary to insert external resistance in the primary circuit to reduce the initial current to an allowable value. Split-phase motors not supplied with a centrifugal device for shunting the starting winding must be supplied with a controller for starting duty.

Reducing Primary Voltage.—The most common method of starting single-phase commutator-type or squirrel-cage induction motors which cannot be connected directly to the energy supply circuit is to reduce the primary voltage during the starting period. Enough resistance is usually inserted in the primary circuit to give the desired reduction in the initial current, the usual practice being to limit the starting current to 150% of the normal current value during running periods.

Resistance in the primary circuit is also used extensively in starting polyphase squirrel-cage motors. Starting controllers using this principle are, in general, cheaper and simpler than other types. Another advantage is that as the motor accelerates and the current decreases the voltage across the resistance decreases and the voltage across the motor therefore increases; for this reason it is possible to get the speed of the motor nearer to synchronous speed than it is with any method in which the voltage across the motor is held constant during the starting period.

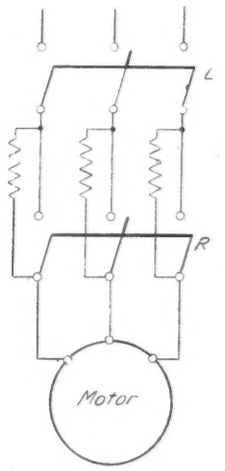


Fig. 64.

Diagram of connections for a 3-phase squirrel-cage motor with resistance in the primary circuit for starting duty.

Fig. 64 shows the connections for a three-phase squirrel-cage motor with resistance in the primary circuit for starting duty. The line switch L is first closed and the motor is connected to the energy supply circuit with resistance in series. After the motor is up to full speed the running switch R is closed, short-circuiting the resistance and connecting the motor windings directly to the supply circuit. Although the drawing shows resistance in all three phases, practically the same result can be obtained by inserting resistance in only two of the three phases. On controllers for 2-phase motors one unit of resistance is inserted in each phase, and for single-phase motors one unit only is required.

Fig. 65 is a diagram showing how the proper amount of external resistance in the primary circuit can be calculated. Assume that the line voltage is E_L and that it is desired to reduce the voltage (E_M) per phase in a delta-connected motor to 50% of normal value. With the average squirrel-cage motor the initial current is 300% of normal when 50% of the normal voltage per

phase is impressed across the terminals of the motor, and the power-factor of the motor is approximately 50%. The resistance per phase

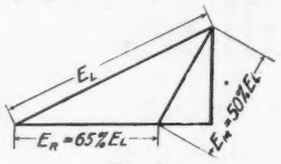


Fig. 65.

Vector diagram showing how to calculate the amount of resistance for starting duty with a squirrel-cage motor.

will then be the voltage across the resistance divided by the current. For 3-phase circuits it is necessary to introduce the constant $\sqrt{3}$, and the resistance $R = \frac{E_R}{1.73I}$, where I is the line current. From the drawing it will be noted that $E_R = 65\%$ of E_L; therefore the resistance can be calculated from the formula,

$$R = \frac{0.65E_L}{1.73I}$$

If resistance is placed in only two of the three phases the value of R must be increased 50%.

The value of the line current is the same as the motor current when the method of using resistance in the primary circuit is used, and since it is usually necessary during the starting period to employ at least three times normal current, the line current is objectionally high for some installations. For this reason primary-resistance controllers are seldom used in connection with motors of more than 25-hp. rating.

Auto-Transformers for Starting Duty.—When auto-transformers are used for reducing the primary voltage during the starting period the line current is less than the motor current. If the

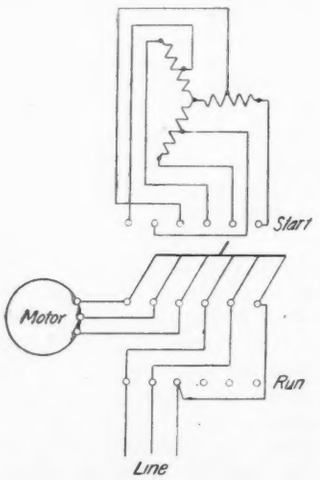


Fig. 66.

Diagram showing auto-transformer connected in star or "Y" for starting duty.

motor is connected to the 50% taps of the transformers the line current will only here be a little more than half of the motor current. If the motor current is 300% of normal the line current will be approximately 175%, and this feature makes the use of auto-transformers more desirable than resistance in the primary circuits. Not only are high starting currents avoided but no power is lost as by the use of primary resistance. On the other hand, auto-transformer controllers are more complicated and expensive than those of the primary-resistance type.

There are two methods of connecting auto-transformers. Fig. 66 shows the "Y" connection and Fig. 67 shows the "V" or open-delta connection. Experiments have shown that the results obtained with the two types of connections are practically the same. In either case the transformer is connected to the line, and the motor to the starting tap of the transformer for starting duty. In the running position the transformer is disconnected and the motor connected directly to the line.

Nearly all auto-transformer starting controllers are arranged for starting as outlined above. Occasionally, however, the connections are ar-

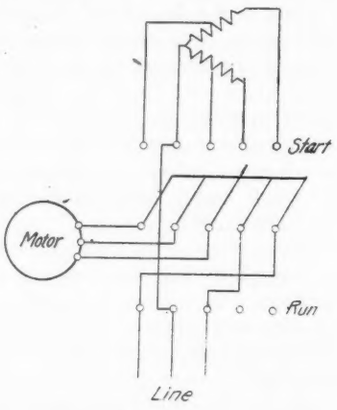


Fig. 67.

Diagram showing auto-transformer connected in open delta or "V" for starting duty.

ranged so that the motor is connected first to a low-voltage tap on the transformer (usually about 40%), then to a higher tap, and then to the line. The advantage of this arrangement is that the current surges during the starting period are held to an allowable value, but this advantage is usually more than offset by the fact that the controller must be very complicated.

Synchronous motors are usually started by the auto-transformer method.

Star-Delta Connections for Starting Duty.—If a 3-phase motor which is delta connected during the running period is star connected during the starting period the voltage across each winding will be reduced to 58% of normal, as indicated by Fig. 68, and the initial current will be approximately 350% of normal. Motors started in this way do not require auto-transformers or resistance in the primary circuit. The initial current is, however, high, and it is impossible to change the starting current as with the other types. For this reason this method of starting is used with small motors only. The scheme is also open to the objection that it is necssary to bring six leads out of the motor instead of three.

Two-Voltage Supply for Starting Duty.—In some plants where a number of squirrel-cage motors are used it has been found good practice to use one large starting transformer instead

of a transformer for each motor. The capacity of the large transformer, of course, is less than the aggregate capacity of the small transformers because of the diversity factor, there being little chance that all of the motors will be started at one time. With this arrangemnt, however, it is necessary to use five line wires instead of three.

Starting With Impedance in the Primary Circuit.—Impedance coils are sometimes used for starting, being connected into circuit in the same way as primary resistance. This method, however, has not come into general use principally because resistance is comparatively cheap and impedance coils present greater manufacturing and testing difficulties.

Secondary-Resistance Starting Controllers.—Slip-ring motors are nearly always started with resistance in the secondary circuit. This resistance is shunted out step by step as the motor is accelerated.

The rotors of slip-ring motors are wound either 2-phase 3-wire or they are 3-phase, but the vast majority are of 3-phase type. The ends of these windings are brought out to slip rings and the resistance is connected to them for starting. The resistance is usually "Y" connected, although for some manual starters the "V" or open-delta connection is used. When the motor is at rest and the primary circuit is connected to the line a voltage is induced in the secondary circuit similar to that induced in the secondary circuit of a transformer. If the secondary circuit is open no torque will be produced and the motor will not start. If, however, resistance is connected across the slip rings the secondary circuit will be completed and the induced current will cause the motor to start. The starting current can be varied by changing the amount of resistance. The proper value of resistance can be calculated from the formula,

$$R = \frac{E \times K}{1.73 \times I \times C},$$

where R is the resistance per phase if "Y" connection is used, E is the open-circuit secondary voltage at standstill, and I is the full-load secondary current of the motor. K is a constant which takes care of secondary drop, leakage and

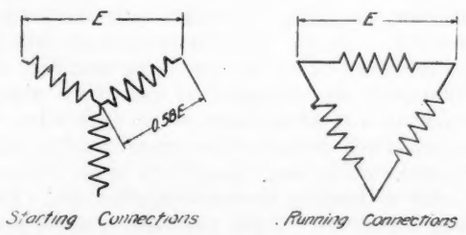


Fig. 68.

Diagrams showing star connections for motor during starting period and delta connection during running period.

line drop. It varies from about 0.6 for small motors where a high initial current is allowed to 0.9 for large motors where the initial current is low. C is a factor which represents the amount of initial current; if it is desired to limit the starting current to twice normal C will equal 2, etc.

Other Methods of Secondary Starting.—Although practically all slip-ring motors are started by means of inserting resistance in the secondary circuit other methods have been used.

One method is to connect impedance coils in parallel with the starting resistance. During the

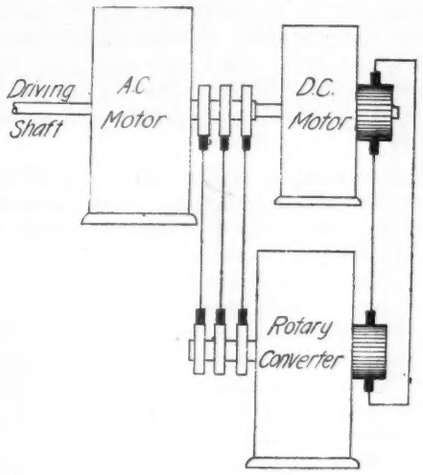


Fig. 69.

Kraemer system of connections for obtaining speed control with slip-ring induction motor.

starting period the frequency of the secondary circuit is so high that there will be practically no current in the impedance coils, and the result obtained will be the same as that obtained with an ordinary resistance starting controller. As the motor accelerates the frequency of the secondary circuit becomes lower, allowing a larger amount of current in the impedance coil, until at full speed the secondary frequency is practically zero and the impedance coils act as a short-circuit for the resistance. Impedance coils alone have also been used instead of resistance.

Speed-Regulating Controllers.—The speed of single-phase commutator motors can, in general, be varied by the use of resistance in series. Slight variations in the speed of induction motors may also be obtained in this way, but due to its inefficiency this method is practically never used. The speed of induction motors can be varied by changing the frequency of the supply circuit or by changing the number of poles of the motor. The latter method is becoming quite common.

It is also possible to regulate the speed of a synchronous motor by varying the frequency, but frequency-changing methods are seldom used either for induction or synchronous motors.

Slip-ring motors can, of course, be varied in speed by the use of resistance in the secondary circuit.

Concatenation.—The speed of slip-ring motors may also be varied by what is known as concatenation or cascade connection. In this arrangement two motors are connected together mechanically and the primary circuit of the second motor is connected to the slip rings of the first. The speed of the combination depends on the number of poles of the two machines, and whether they are connected so that they tend to run in the same or opposite directions. When connected to run in the same direction the speed is the same as that of a motor with a number of poles equal to the sum of the poles of the two

machines. When connected to run in opposite directions the speed is the same as that of a motor with a number of poles equal to the difference of the poles of the two machines.

The above is true only if the slip rings of the second machine are short-circuited. If resistance is inserted in the secondary circuit of the second machine, further speed changes can be obtained.

Concatenation requires two machines, and, in addition, the power-factor and efficiency are low. The multispeed motor is found to be more satisfactory.

Kraemer System of Control.—Fig. 69 shows another method of obtaining speed control with a slip-ring motor. In this case a direct-current motor is connected to the slip-ring motor mechanically. The latter is started as an ordinary induction motor, but when up to full speed the starting resistance is disconnected and the slip rings connected to the slip rings of a rotary converter. The direct-current side of the rotary is connected to the direct-current motor armature. The speed of the equipment is controlled by means of a rheostat connected in the field circuit of the direct-current motor. With this method there are no rheostatic losses and the speed is practically constant at all loads. It has the further advantage that the power-factor may be regulated by means of the converter-field rheostat. The control equipment is, however, complicated, and the fact that three machines are required is sometimes objectionable. This type of control is frequently used for driving rolls in steel mills.

Braking of Alternating-Current Motors.—Slip-ring motors can be stopped quickly by reversing or "plugging." Another method frequently used is to disconnect the primary and supply direct current to one phase of the stator winding. The revolving rotor will then generate an e.m.f., and if resistance is connected across the slip rings dynamic braking will be obtained. Graduated braking can, of course, be obtained if the resistance is reduced as the motor slows down. The starting resistance is usually utilized for dynamic braking, and if secondary series-relay control is used graduated braking can be obtained.

Reversing of Alternating-Current Motors.—The direction of rotation of single-phase induction motors which are started by the split-phase method can be changed by reversing the connection of either the starting or running winding.

Repulsion motors can usually be reversed by shifting the brushes. Instead of shifting the brushes some motors are supplied with an extra brush, and the direction of rotation can be changed by connecting the middle brush to either one or the other of the outside brushes.

The direction of rotation of polyphase induction or synchronous motors can be changed by reversing the connections to any one phase. On a 3-phase motor any two lines may be reversed; on a 2-phase, 3-wire machine the two outside wires must be interchanged for reversing, and for a 2-phase, 4-wire machine the two wires of either phase may be reversed. In any case a double-pole double-throw switch or its equivalent must be used.

Duty and Operation of Alternating-Current Controllers.—The resistors and switch gear used on alternating-current controllers are subject to practically the same limitations as direct-current apparatus. For starting duty neither the resistors nor the other current-carrying parts need be designed for continuous duty, while if a controller is to be used for speed-regulating duty all parts must be designed to carry current continuously.

It is possible to build either manual or automatic controllers for any of the types of control outlined, the method of operation depending on the installation conditions.

EDUCATIONAL COURSES CONDUCTED BY WESTERN ELECTRIC CO.

The will to learn is being fittingly demonstrated by the workers of the electrical industry. Nearly 1500 employes of the Western Electric Co. are busy these winter evenings attending the educational courses which are being conducted at the many branches of the company throughout the country. What makes the figures particularly interesting is the fact that attendance at the schools is entirely voluntary. The records of the classes conducted at the company's big factory near Chicago show an enrollment of 962 employes this term. The courses in telephone practice and mechanical drawing have proved the most attractive, 225 being registered in the former and 124 in the latter. The other departments in the order of their apparent attractiveness to the plant personnel are practical mathematics, sewing, comptometry, electricity and magnetism, typewriting, English, accounting, production and manufacturing principles.

The opportunities for advancement offered in the night schools appeal alike to the factory operative, the engineer, the clerk and the salesman. 332 members of the engineering department of the company using their spare moments as study periods. They are paying particular attention to the class in machine switching, a subject which has become of vital importance to technical men since the introduction of the automatic telephone into commercial use. Applications for this branch ran so high in numbers that it was necessary to split the class into two parts. The principles of direct and alternating currents and shop mathematics are also big favorites with the embryo executives. Classes in accounting and the general routine of business are being conducted at the offices of the company at 151 Fifth avenue, and also at 195 Broadway, New York City, 110 representatives from the two metropolitan offices being enrolled in five classes. The directors of the schools demand constant application. These classes are a part of the company's fixed policy of being always on the lookout for men who show promise in administration, mechanics or other of the varied fields of endeavor which the company's extended activities embrace.

When the electric furnace is properly designed and handled it is so subject to control that its use is destined to be immensely expanded in the near future, according to the experts in the American Electrochemical Society.

Success Crowns Lighting Fixture Conventions

Two-Million-Dollar Sales Mark Reached at Buffalo Market—Expressions of Enthusiastic Visitors Commending Energy of Promotors—Optimistic Expectations Are More Than Fulfilled

When the National Council of Lighting Fixture Manufacturers, the Lighting Fixture Dealers' Society of America and the Illuminating Glassware Guild planned their conventions and the Lighting Fixture Market for the same week in Buffalo this year, they builded better than they knew. Much was expected — these men have had their fingers very much on the pulse of old Gen. Business Conditions and knew his illness was only of a temporary nature — but the most optimistic among them did not begin to anticipate the results of this past week's event.

Fred R. Farmer.

Business of many ordinary weeks was crowded into the short span of one brief and exciting week. The mingling together of these affiliated interests in a co-operative spirit created a business enthusiasm that resounded throughout the Fixture Market and conventions, and its echoes will be heard to the end of the year in every corner of the United States and Canada with encouraging results.

There was a feeling of friendliness and good fellowship introduced early at the first session of the fifth annual convention of the Lighting Fixture Dealers' Society of America, by President C. J. Netting, when he insisted that each one present clearly announce in turn his full name, city and firm represented. This started the meeting off with a snap and vigor which was reflected in all subsequent proceedings.

The activities of and benefits derived through the formation of local lighting fixture dealer clubs and membership in the national body were interestingly and enthusiastically described at the first session by "Jim" Kelly, Philadelphia; "Buddy" Paxon, Cleveland; Herbert Brown, Milwaukee; Frank Callahan, Detroit; Albert Jacobson, Kansas City; "Herb" Sackett, Buffalo, and "Bill" Collins, Pittsburgh. Many non-members signed application blanks for membership in the National Society immediately following.

The chairman of the Committee on Resolutions, W. C. Thompson, presented the following resolution, which was unanimously approved by the members:

"Be it resolved: That at each and every session of this body, the president announce from the chair that all members are requested to patronize the exhibitors that conform with all the rules and regulations of the National Council of Lighting Fixture Manufacturers."

The members of the National Council of Lighting Fixture Manufacturers at the first session entered into discussion of what is generally agreed to be one of the most pressing problems of the lighting fixture industry—the stimulation of design, and the adequate protection of new designs.

President Farmer announced that owing to the inability of John F. Malone, commissioner of the Buffalo Convention Bureau, to be present, the meeting would be presided over by E. F. Caldwell. Mr. Caldwell said that in 1920 the question of piracy of design came up at the Detroit convention in the form of a committee report subsequently distributed to the various locals. A series of papers dealing with the various aspects of this design problem were presented during the session, giving suggestions as to the methods of obtaining new design ideas and for better protecting these designs when they had been produced.

Mr. Caldwell had a paper prepared which was clearly and forcefully presented by Franz Brzeczkowski, president of Moran & Hastings Manufacturing Co., Chicago. This paper related experiences with technical school students in industrial design courses. They appeared to be eager for fundamental information, but did not have the time available to absorb it. He suggested that lighting fixture manufacturers encourage visits of such students to their factories, resulting in a keener appreciation by these students of the importance of the lighting fixture industry and a possible enlisting of some of these students as apprentices (in effect) in designing new fixtures.

A very able paper by W. R. McCoy, of New York, on "The Stimulation of Design," followed and was highly appreciated, judging from the applause. W. E. Cochran, Cleveland, then read his paper on "The Institution of a Prize Contest" and his suggestions were also favorably received.

President Farmer, of the National Council of Lighting Fixture Manufacturers, with his cus-

tomary ability to pick workers, appointed the following committees: For the selection of the place for the 1922 convention, Fred Schwartz (New York City), J. N. Riddle (Toledo, O.), and Franz Brzeczkowski (Chicago); Committee to Audit Records, Charles D. Very (St. Charles, Ill.), and Herbert Selzer (Philadelphia); Committee to Confer With Dealers, William Horn (Philadelphia), E. F. Guth (St. Louis) and Albert Morreau (Cleveland).

Comprehensive Program Carried Out by Glassware Guild.

At the initial session of the Illuminating Glassware Guild plans were discussed for keeping pace with the rapid developments in the lighting field and supplying the growing and expanding market for illuminating glass. It was apparent to all manufacturers present at the meetings that the time has arrived to make a careful survey of the glassware field and study the tendency toward future development of the industry. This is a problem that should be solved by the Guild rather than by an individual member and all the members profited by the observations made.

Nearly all of the members of the Illuminating Glassware Guild have installed uniform cost systems and know exactly what their production costs are. Rule-of-thumb methods with their obstacles to growth and prosperity, have entirely been abandoned. All the members have collaborated in the matter of preparing a uniform cost system with the result that there is today among the membership of the Illuminating Glassware Guild a complete understanding of production costs.

Investigation in the matter of costs proves conclusively that no reduction in prices is possible at the present time. Such items as labor, materials, freight, etc., make a reduction in costs before next fall impossible. Buyers at the market this year were given the benefit of the lowest possible prices commensurate with manufacturing costs. Manufacturers have accurately figured their costs and there can be no changes in these figures.

The following resolutions of suggested acitivities adopted by the Glassware Guild, which are pregnant with possibilities for the future, illustrate the thoroughness and efficiency aimed at by the Guild:

> Resolved, That the manufacturers of illuminating glassware, in meeting assembled for the purpose of completing the organization of the Illuminating Glassware Guild, suggest to the officers of the Guild the following activities:
>
> (1) Consideration of cost accounting methods and recommendations to members of an adequate cost accounting system.
>
> (2) Consideration of standardization and manufacturing problems, such as manufacturing methods and practices, quality of raw material and finished product, etc.
>
> (3) Consideration of packing and shipping problems, such as style and quality of packages, etc.
>
> (4) Collection and compilation of statistics, bearing on the industry, for the benefit of members.
>
> (5) Consideration of the market for raw materials and fuels used by members.
>
> (6) Consideration of merchandising methods and channels of distribution to best insure the expansion of the industry.
>
> (7) Consideration of credit terms and collections, methods and the value of exchange of credit information.
>
> (8) Consideration of policies as regards returned goods, credit allowances, defective goods, breakages and shortages.
>
> (9) Consideration of questions such as freight rates, insurance rates, tariffs, etc.
>
> (10) Consideration of questions pertaining to designs, etc.
>
> (11) Consideration of affairs pertaining to or affecting our industry in general.
>
> (12) Consideration of co-operation with other branches of the electrical and lighting industry.

It may be safely predicted that the co-ordinated effort of members of the Illuminated Glassware Guild, directed along these lines and given new impetus by this convention and fixture market, will be reflected in the greater influence of the

Illuminating Glassware Guild Convention Successful.

W. F. Minor, vice-president of the Illuminating Glassware Guild, who presided in the absence of President Blumenauer, had the following to say regarding the Buffalo convention of that body:

"The members of the Illuminating Glassware Guild united in declaring that their convention in Buffalo was the most harmonious, most progressive, and most optimistic gathering of illuminating glassware manufacturers ever assembled.

"Every session resulted in some progressive action, and among the matters passed upon favorably by the members in attendance were: A salaried secretary for the purpose of gathering statistics on the illuminating glassware industry and establishing proper cost systems, the standardization of fittings and proportions to bring about further improvements in the manufacturing of lighting fixtures, the appointment of a committee to meet with the National Council of Lighting Fixture Manufacturers and the Lighting Fixture Dealers' Societies to discuss matters of interest to the entire lighting industry.

W. F. Minor.

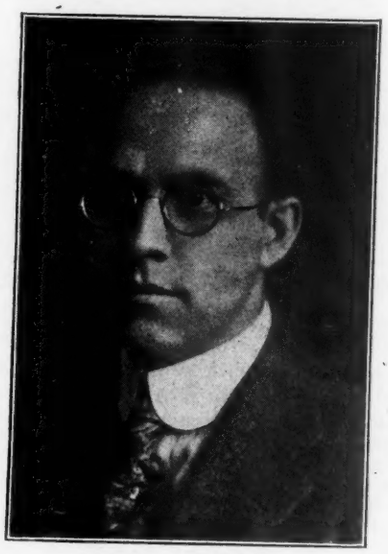
"The only disappointment of the convention was the absence of C. H. Blumenauer, president of the Illuminating Glassware Guild, who was compelled to remain away because of pressure of business matters."

Impressions of the Fixture Market and Convention.

"To attempt to convey, to those who were not at Buffalo during the past week, a word picture of the Fixture Market and of the convention sessions of the National Council of Lighting Fixture Manufacturers, is a task which I am unable to perform. I am still too close to it," says Charles H. Hofrichter, secretary-treasurer of the National Council of Lighting Fixture Manufacturers.

"Undoubtedly the center of great interest to those present was the assembly of exhibits at the Fixture Market in Elmwood Music Hall. To enter any sort of a retail store has always been an experience which has fascinated me. To see the large number of fixture creations hanging from the ceiling, some lighted and some not lighted, has always made me feel that I would like to pause and admire, but to have such display multiplied many times over, and to have such a large variety of variously made and well-executed dreams of the lighting fixture designer hung before us was indeed a privilege that is very rare to most any lighting fixture manufacturer or retailer.

"Manufacturers very willingly displayed the best of their product and we are safe in saying that many a lighting fixture dealer knows better now than ever before of the variety of offering that the lighting fixture manufacturer has for his customers. Table lamp displays were also of very much interest, as well as those of silk and parchment shade manufacturers. For the first time,



Charles H. Hofrichter.

the glass manufacturers' exhibits were thrown open to both the manufacturer and the dealer.

"In spite of the fact that business conditions were against the market from the selling standpoint, and that many dealers had large stocks of fixtures on hand, the business transacted at the market reached a surprising total. Tabulations are still being made.

"Probably one of the greatest benefits to the industry as a whole was the growing consciousness on the part of both the manufacturers and dealers that the economic position of this industry is solid. The lighting fixture business did not enjoy any of the abnormal war activity. In fact, its production decreased during the war period rather than increased. It has not been overexpanded, nor has its labor been inflated as was true of a great many other industries. For these reasons the prices of lighting fixtures were not abnormally advanced. The average price of the fixture manufacturer today is a result of really more normal advancement in the industry than any abnormal advancement, and for the same reason is not very likely to be subject to any material reduction.

"Undoubtedly one of the greatest accomplishments of the entire week at Buffalo was the greatly improved spirit which predominated among both the manufacturers of fixtures and glassware, as well as the lighting fixture dealers. The fact that we as an industry could get together and demonstrate our confidence in each other seemed to be a source of delight and inspiration to every delegate present. The fact that we as an industry could further realize that there were common problems that confronted every branch of the industry, and which could best be handled in a co-operative manner, was given greater impetus because of the demonstration that was before them in the market and during the convention sessions.

"The interest shown by the public of Buffalo in visiting the market during the evening hours when it was open for inspection was quite intense, and proved beyond a doubt that plans for Better Lighting Week could be developed so as to make it a project of great public interest.

"Members of the Lighting Fixture Dealers' Society, of Buffalo, are deserving of very much credit for the way they handled the registration and entertainment of the delegates, and so is the Hale Decorating Co. for the way in which it handled the erection of the booths and the decorations of the hall.

"One man who was an eye witness of the speed and rapidity with which the booths were erected and decorated, said that it reminded him more of the speed with which a circus sets up its tents for a performance than anything else he had ever seen.

"The enthusiasm created by the singing of the Milwaukee delegation, who were strenuously campaigning for the next market; also by the Philadelphia delegation who were well equipped with songs to advertise their own home town, was such that made us feel it was really good to have been there, and to those who were not privileged to enjoy it all with us, the best thing we can recommend to you is to plan now to attend the 1922 Fixture Market and convention of these lighting fixture organizations.

"The *National Lighting Rays*, the official organ of the National Council of Lighting Fixture Manufacturers, was issued as a Convention Daily by the very able staff of the Electrical Review, of Chicago (ably assisted by Frank B. Rae, Jr., and V. D. Green). It brought to us all the intimate personal touch and pleasantries, and made them the enjoyable features of all the delegates instead of just a few. It added greatly to the spirit and 'pep' of all the meetings, and not a few copies were mailed back home by the delegates to give those left behind an impression of what was being done."

Guild as a prominent factor in the field of applied illumination.

Joint Luncheons Productive of Closer Co-operation.

At the joint luncheons participated in by many members of the three organizations, the psychology of mingling food with reason resulted in greatly stimulatnig co-operation and developing new ideas. The speakers were of the best calibre and they drew out constructive discussion from even the most modest and retiring members.

With a gathering that taxed beyond capacity the banquet hall of the Hotel Iroquois, the first joint luncheon of the National Council of Lighting Fixture Manufacturers, Lighting Fixture Dealers' Society and the Illuminating Glassware Guild, with H. I. Sackett, vice-president, Buffalo

Lighting Fixture Association, as toastmaster, was a marked success.

The first speaker was C. J. Netting, president, Lighting Fixture Dealers' Society. Among other ideas he expressed, with characteristic vigor and timeliness, the hope that the question of cash discount would be settled at this convention. The manufacturers should be big and broad and make it an object for the dealer to be prompt in payment, thereby learning one of the fundamentals of good business. The manufacturer wants the dealer, needs the dealer and must have the dealer to successfully conduct his factory. The dealer has done a lot in the past and can do more in the future, if properly led, not compelled. When manufacturers appreciate their full responsibilities and measure up to them, then and only then will they have done their part and can expect the proper returns to which they feel themselves entitled.

Since C. H. Blumenauer, president, Illuminating Glassware Guild, was unable to attend, Edwin Gillinder, representing the Association, stated with commendable frankness that his ideal was an idea, namely, first honesty, then courage and then brains. "Have we always been fair with our competitor in our dealings, in the selling of our merchandise? Have we courage when business drops 20% or more, to take our share of the business at a profit or do we go out and try to get a little of the other fellow's business at a lower price, with a consequent demoralization of the industry? Then brains. We have lots of them in the industry, but are we willing to use our time, our energies, and our talent to help elaborate the standard of the industry so that it may occupy the position in the land which it deserves."

Unity and co-operation among the allied interests of the industry was the inspiring message delivered by Fred R. Farmer, president, National Council of Lighting Fixture Manufacturers.

"Bill" Goodwin Delivers Another Good Message on Co-operation.

The wonderful spirit of jollity displayed at the second joint luncheon recalled to many the good old college days as Milwaukeeites vied with Buffalonians and Philadelphians in out-cheering and out-singing each other to attract prominence to their city representatives, creating an admirable atmosphere for the complete enjoyment of the occasion.

After a few introductory remarks, Toastmaster C. J. Netting, president, Lighting Fixture Dealers' Society, presented the popular, dynamic W. L. Goodwin, who was greeted with cheers and prolonged applause.

Mr. Goodwin, after recalling the demoralized condition of the lighting fixture industry a year ago, pictured the remarkable advances made in 1920 and the bright outlook for the future. "New methods of marketing fixtures must be developed if existing evils are to be eradicated and a firm policy that will put the institution above the individual should be established," said Mr. Goodwin. "The question of piracy of design should be given mature consideration before any action by the organized industry is taken. The previous demoralized state of the lighting fixture industry

Lighting Fixture Dealers' Society of America.

One of the outstanding features of the recent Buffalo convention was the number of dealers who left Buffalo with their minds made up to form local clubs immediately upon their return home. Representatives from New York, Chicago, Kansas City, Rochester, Spokane, Seattle and New Orleans were among the most prominent to start organizing local chapters.

The cities now having local clubs showed their appreciation of the work the National Society is doing by jointly donating over $5000 for use by the National Society during 1921 in its work of organizing the lighting fixture dealers. The eagerness with which the many members attended the special educational meetings held at 8:30 each morning proved that interest in the society's work is alive.

Great interest was demonstrated in the opportunities which will become possible through co-operation with the Underwriters' Laboratories and the National Electrical Code Committee.

J. L. Wolf.

That the Lighting Fixture Dealers' Society is a well-managed, governable and harmonious organization was thoroughly proven in the discussions of the many intricate problems brought before the dealers in the various sessions. The open forum made possible by organization brought to the surface many problems common to fixture dealers in many parts of the country, and united action resulted in speedy and satisfactory solution of many difficulties pertaining to income tax statements, rebates for breakage of glassware, co-operation from fixture and glassware manufacturers, etc.

That the action of the Lighting Fixture Dealers' Society in many matters is of great importance to every fixture dealer in the United States is a foregone conclusion. That every lighting fixture dealer in the country ought to know about the widespread influence of action of the Dealers' Society at this convention ought to be apparent to every dealer, and my own observation of the proceedings at the convention prompts me to appeal to every dealer in the fixture business to ally himself with this organization. The need for organized effort among dealers was never greater. Every branch of the electrical industry is now thoroughly organized and dealers, in order to profit from their business to the fullest extent ought to be 100% organized.—J. L. Wolf, Secretary, Lighting Fixture Dealers' Society of America.

was caused, first, by absence of proper organization; second, lack of acquaintance of men in the industry with each other; third, lack of appreciation of the mutual interests of those engaged in the business; and fourth, the presence of a seller's market and an ignorant public. And now that these conditions have all been remedied, the industry has a wonderful field ahead.

"As a rule, the fixture manufacturers and dealers do not appreciate the economic value of the service performed by the electrical supply jobber as a stabilizer of the industry, but it is a point well worth considering. The industry should be deeply indebted to the trade press for the splendid and generous publicity given to this convention and fixture market and the co-operation extended.

"The one big advantage of the fixture hung like a picture is that for the first time the fixture dealer will be brought into direct contact with the ultimate consumer and give him an opportunity to sell on a pride-and-quality basis. However, don't give an opinion on this type of fixture until the manufacturers agree among themselves on a standard, and market that type only. The home of the future will be wired with three circuits. One for light and illumination, another for art, and a third for color. Then it will be possible to produce beautiful effects unrealized by most of us today.

"The fixture market should be a place where all manufacturers come together to observe the design and style of competitors and thereby avoid future piracy of design; where the efforts of the previous year in design, construction and selling policy may be displayed and where an opportunity will be afforded to bring together the best minds of the allied organizations for laying future plans and preventing repetition of past mistakes."

Farmer Advocates Permanent Lighting Fixture Market.

The members of the Lighting Fixture Dealers' Society at the Wednesday morning session sat up and listened with intent approval when Fred R. Farmer, president, National Council of Lighting Fixture Manufacturers, in his address before that body stated that the manufacturers had spent $40,000 on the Buffalo Fixture Market, and he personally advocated the establishment of a permanent fixture market which would materially reduce this yearly preparation expense and give permanent central headquarters to all the allied interests of the industry. Continuing, he pointed out clearly the other numerous advantages attached to the project and so impressed his hearers that before adjournment a resolution was unanimously passed authorizing the appointment of a committee to confer with the allied organization committees, make an exhaustive study of the matter and report at the 1922 convention. He also made a forcible appeal for unity in the industry and the elimination of reference to the different interests as three organizations. "We must sell the industry to the public and attract the right kind of money and brains to the industry before complete success will be attained," he said.

Earlier in the meeting, W. L. Collins, whose work as chairman of the Manufacturers' Committee, has earned the commendation of the entire membership, reported that during the past year the members of the National Council of Lighting Fixture Manufacturers had agreed to the following construction changes in fixtures:

1. On all single-chain suspension fixtures with lamps of 200 watts or over, ⅜-in. threaded iron pipe, with holes large enough to take two strands of No. 14 rubber-covered wire, will be used.
2. Outside lanterns and brackets to have ⅜-in. thread size fittings for sockets and ⅜-in. iron thread or larger for joint and crowfoot.
3. All candle fixtures and brackets where sockets are furnished to have new style candle hickey and stem.

Also the manufacturers agreed to refrain from doing business direct in the territory of a recognized dealer; follow specified suggestions on packing and marking; state a definite time for acceptance of quotations and within a reasonable time factory will confirm acceptance of orders.

The dealers voted that those manufacturers of complete fixtures, who were printing a picture of the contents on the outside of each package for facilitating identification, be commended; also that it be suggested to the manufacturers that tags with both the fixture number and label of the National Council of Lighting Fixture Manufacturers be attached to both the fixture and the package. A motion was adopted to request the manufacturers to equip those appliances having a socket attachment with a standard separable plug.

President C. J. Netting, of the Dealers' Society, appointed the following Committee on Constitution and By-Laws: J. B. Kelly, chairman; W. C. Hogan and W. G. Kepler; Committee on Nominations, H. J. Rueff, chairman; R. T. Paxson and H. B. C. Mitchell; Committee on Membership, William Wolf, chairman; J. A. Crouch and W. E. Thompson; Committee on Resolutions, O. A. Barber, chairman; A. G. Goldstein and Fred Laube; Committee on Local Club and National Advertising, J. H. Hamilton, chairman; F. J. Callahan and E. R. Gillett.

The chief feature of the Wednesday morning session of the National Council convention was the series of "Ten-Minute Papers" by presidents of the local divisions of the National Council of Lighting Fixture Manufacturers. Herman Plaut and Bernhard Blitzer gave very encouraging accounts of the two New York City locals, followed by equally heartening statements by William Horne for Philadelphia, W. E. Cochran for Cleveland, Arthur Polacheck for Milwaukee, and E. F. Guth for St. Louis. These will be covered in the March 12 Lighting Issue of the Electrical Review, together with reports from the other cities.

Illuminating Engineers Co-ordinate With Fixture Men.

Another field of co-operation is promised by the joint activities of the committees representing the Fixture Manufacturers and the Illuminating Engineering Society, respectively. W. R. McCoy, of the Cassidy Co., Inc., is chairman of the committee representing the Fixture Manufacturers, and M. Luckiesch is chairman of the committee appointed by the I. E. S. to co-operate with the Fixture Manufacturers.

"It is hoped that the joint efforts will result

in the correlation of certain fundamental principles of good lighting, of standardization of mechanical parts and lamps, and lighting practice," says Mr. Luckiesch. "It is the intention to prepare a code of fixture design and of usage without in any way limiting the designer in realizing artistic ends. The committee has had three joint meetings and appears now to be ready to prepare a tentative code which will be submitted to those interested for criticisms and suggestions. It will be helpful if designers, and others will send suggestions now. These may be addressed to W. R. McCoy, The Cassidy Co., Inc., New York City, or to M. Luckiesch, Nela Park, Cleveland."

There is no intention on the part of the committees to lay down rules which would eliminate individuality in fixture design and in lighting. The aim is merely to co-ordinate fundamental principles which must be recognized if we are to have good lighting and a degree of simplicity in fittings, lamps and other mechanical parts.

To Create Board for Adjustment of Piracy of Design Cases.

Chairman E. F. Caldwell, New York, at the Thursday morning session of the Fixture Council, opened up the discussion of the proposed resolution covering the proper course of procedure in penalizing piracy of fixture designs carried over from the reading of this proposed resolution by Frank Brzeczkowski, of Chicago. The original resolution will be printed in the March 12 issue of Electrical Review. After considerable discussion the resolution was adopted for incorporation in the By-Laws with the following changes:

An amendment was adopted to the effect that each local division may appoint a local conciliation board to which questions of piracy of design arising locally may be referred for adjudication. This local conciliation board will have the same authority to fix and enforce the penalties as originally planned for the National Board of Conciliation, reserving the latter as a final board of appeal only in important cases of more than local scope.

It was also provided that the recommendations for attempting amicable settlement out of court previous to making a formal complaint should be incorporated as one of the articles under the method of procedure finally adopted.

Dana Pierce, vice-president, Underwriters' Laboratories, New York City, spoke briefly on the requirements of the Underwriters affecting the wiring of electric fixtures for safety and elimination of fire hazard.

Alexander Vincent, of the Brookmire Economic Service Co., then spoke on the subject, "Statistics of Our Industry, Their Value and Use." He pointed out the necessity of getting down to the truth of conditions in any industry or profession in order to systematize planning and simplify procedure (or production) and to induce new activities and research leading to more business and greater profits.

"General conditions, industry conditions, and conditions affecting individual concerns only, should all receive proper weight in any analysis by any particular individual concern," said Mr. Vincent. "The effect of general financial conditions on purchasing power, of general supply and demand conditions on production are examples of this inter-relation. The firm having the most comprehensive data along these lines is in the strongest position. General conditions may be observed in the newspapers, trade papers and various bureaus and departments in Washington.

"More specialized service is rendered by economic services interpreting the general conditions observed as above. More detailed conditions applying to the individual company are indicated by books and accounting records of daily business. Co-operative statistical work within an industry has resulted in a tremendous impetus in trade association activity and will grow in importance as the individual concern realizes the narrow-mindedness of keeping secret the data for his business that is of general application. All these statistics must be intelligently compiled and interpreted or they become worthless or misleading.

"This data must not be used by trade associations to arbitrarily control the course of business in that particular industry because fundamental economic laws canot be permanently disregarded."

Dana Pierce Talks to Dealers About National Code.

The dealers, at their Thursday morning session, had a very profitable addition to their program in the person of Dana Pierce, vice-president, Underwriters' Laboratories, and chairman, National Electrical Code Committee, to whose untiring labors in that capacity the entire electrical industry is deeply indebted. Mr. Pierce said that he looked forward to the day when the electrical rules and regulations of the insurance fraternity would be formulated by men interested in the industry, and not by outsiders. He also advocated the appointment of a small representative standing committee of qualified electrical men to confer with the National Board of Fire Underwriters on electrical matters and to draw up regulations which could be followed. Questions which are still undetermined and should have early attention, are thickness of rubber insulation; safety to persons of fixtures and standards of strength and construction for fixtures. Commenting upon the importance of safety, he declared that unless electric flatiron manufacturers equipped their appliances with a dependable automatic temperature control, in a few years every householder using this convenience would have to pay an additional fire insurance premium.

O. H. Caldwell, editor, *Electrical Merchandising*, gave an illuminating talk on the opportunities open to fixture dealers for developing new business. A resolution in appreciation of the co-operation and publicity extended by the trade press to the joint organizations was then unanimously adopted.

During the discussion of the report of the Glassware Manufacturers' Committee motions were passed condemning the practice of central-station companies and dealers in selling Mazda lamps below list prices, and requesting manufacturers of glassware to include in the standard package cost, the cost of packing item.

Herman Plaut, as chairman of the Membership Committee of the Illuminating Engineering Society, made an impressive appeal for new mem-

bers from the dealers and their employes, and A. S. Turner, Edison Lamp Works, of General Electric Co., described the purpose of the society and the advantages of membership.

President Netting appointed the following committees: Next Convention Committee, J. B. Kelly, chairman; H. I. Sackett and G. W. Small; Auditing Committee, H. T. Rueff, chairman; C. H. Swartz and R. C. Steeple.

In line with the suggestion of President Farmer, of the National Council, the Illuminating Glassware Guild has appointed a committee to meet with the National Council and the Lighting Fixture Dealers' Society, and to suggest to them the formation of a central body composed of an equal number of representatives from each of the three affiliated societies to discuss from time to time matters of interest to the entire lighting industry. Thus they hope to aid the formation of one strong organization instead of three individual societies working, perhaps at times, against one another. This committee is composed of E. B. Gillinder, chairman; Paul W. Jenkins, E. H. Peck, C. H. Blumenauer and Marshall T. Gleason.

This committee will further suggest to the National Council the separation of future markets and conventions. It has been found that the pressure of prospective buyers and the market itself interferes with the proper attendance at important meetings. Both market and meetings are important, but under the present plan delegates cannot possibly take advantage of the wonderful opportunities for education and development presented by these conventions.

The Illuminating Glassware Guild discussed in considerable detail, with Mr. Ferris, of the Stevenson Corp., New York City, the establishment of a uniform cost system and a bureau of statistics for the purpose of stabilization of market conditions and the formation of a proper organization for the upbuilding of the lighting industry.

One of the most progressive measures resulting from the joint conventions was this appointment of a committee by the Illuminating Glassware Guild to meet with the other societies and co-operate in matters of mutual interest. It is the opinion of members of the Guild that this is the first step toward an affiliation in some way of the three societies. It certainly presages a greater degree of harmony in the entire fixture industry and a consolidation of interests will solve many problems which arose out of the three societies working in different directions to accomplish the same objects. E. B. Gillinder has been made chairman and is undertaking, with his committee, one of the most important matters resulting from the convention.

What Some of the Visitors Said About the Event.

Shortly before the close of the Lighting Fixture Market and joint conventions, one of the editors of the Electrical Review, who had charge of printing and circulating the National Lighting Rays Convention Daily, interviewed a number of visitors and obtained expressions of opinion regarding the success of the event. Many of these expressions will be printed in the Lighting Issue of the Electrical Review, March 12.

David H. Engelson, of the Universal Metal Spinning & Stamping Co., Inc., believes the fixture displays this year showed remarkable improvement over those of 1920. "Judging from the wonderful spirit of optimism which prevails at the present gathering," declared Mr. Engelson, "I honestly believe that we are in for a year of wholesome prosperity. The public, the dealers and the manufacturers are surely awakening to the spirit of better lighting."

Robert Findlay Manufacturing Co., Inc., reflected a hopeful message through its able repre-

Charles E. Verhunce.

sentatives at the exhibit hall. H. M. Schwartz and Fred Schwartz. The latter expressed the conviction that the dealers are buying more conservatively than they were a year ago. They are not overstocking. This means, he said, that the salesman is pretty sure of getting some business each call on his prospect. H. M. Schwartz was loud in his praise of the present exhibition, and feels that the public is gradually sensing the message of better lighting. "We must give the dealer credit for this state of affairs," said Mr. Schwartz. "He is constantly calling for a better grade of fixtures. He realizes that good fixtures mean satisfied customers."

Bernhard Blitzer, of Lightolier Co., New York City, said:

"This convention is little short of marvelous. During the less than 3 yrs. in which the National Council of Lighting Fixture Manufacturers has been organized it has succeeded, not only in bringing about a spirit of wholesome co-operation and good fellowship in the lighting fixture industry, in organizing that industry, but in really placing the industry on the map. Heretofore it has scarcely been recognized as an industry. Today we find it an organized industry."

Concluding Sessions of Joint Lighting Conventions.

Friday's business session of the National Council's convention was comprised of papers held

over from Thursday, and reports and recommendations of officers.

The very complete report of Secretary Hofrichter was accepted and ordered printed for distribution within the Council. President Farmer reported for the Executive Committee complimenting them on the success of the convention arrangements. This report was accepted with a vote of thanks to President Farmer. O. H. Caldwell gave statistics bearing on the future of the lighting fixture industry in its relation to other branches of the parent electrical industry.

Charles E. Verhunce, secretary, R. Williamson Fixture Manufacturing Co., Chicago, presented an exceptionally strong paper and a committee was ordered appointed for the purpose of developing the proposed policy in the lighting fixture industry. The subject was "Developing a Policy Within the Lighting Fixture Industry—Classification of Customers According to Purchases." He pointed out the difficulty of making specific recommendations, but suggested that service to the consumer should be first considered in planning distribution. Cases differ, and some manufacturers should market direct to the consumer while others should use the jobber-dealer trade channels for distribution. Careful study of the individual problem is the only means for correctly determining the individual policy. A committee on policy might then be appointed from those who have studied individual problems to draft a code of fundamentals for general application. Subjects to be considered by such a committee would be trade classifications, quantity differentials, extra charges for silver and other special finishes, packing charges, cash discounts, etc. This committee should meet with similar committees from the Dealers' Society, Glassware Guild and other electrical organizations to formulate the policy of catering to the popular demand.

C. G. Everson spoke on "The External Educational Policy with Relation to the Public and the Architect." He pointed out the necessity for definite co-operative action.

Secretary Hofrichter presented some constructive ideas regarding a proposed budget plan for general propaganda for the industry. His suggestions were enthusiastically received and a Ways and Means Committee appointed to draw up plans for carrying them out. A resolution to incorporate the Council was introduced and adopted.

The Nominating Committee stated that after careful consideration it was decided that they could not suggest any changes from the present list and, consequently, the officers stand re-elected. This was enthusiastically approved, as the officers have the full confidence of the members. In conclusion, Herman Plaut presented President Farmer with a handsome gold watch inscribed "In Loving Appreciation."

The Friday meeting of the Dealers' Educational Committee under the direction of J. A. A. Hamilton, chairman, proved most interesting and instructive on the subject of a uniform accounting system of the retail fixture trade. A simple completed cost of fixture determination method and a very successful simplified stock record, invoice and classification system were fully explained. One valuable point brought out in the discussion was that in presenting a breakage claim against the railroads, the dealer is entitled to include the freight and packing charges in his cost and take the proper proportional amount of this total as the breakage claim.

A ruling by the New Orleans internal revenue office designates that sample fixtures should not be included in stock fixtures in income tax reports, but treated as a separate item like office supplies and finally grouped under profit and loss computation. Note that this is not a national ruling.

G. E. Laube spoke of his 15 yrs.' experience in the wiring and fixture business, the desirability of organization, and recommended that all ceiling fixtures be wired as electroliers, as has been done in Rochester for the past 10 yrs., so that the owner can have a small light if desired.

The electoral landslide of last November was duplicated at the annual meeting of the Fixture Dealers' Society when "Buffalo Bill" Hadler was an overwhelming victor for the presidency. W. E. Thompson, Indianapolis, was elected vice-president, and H. I. Sackett, Buffalo, treasurer. The newly elected directors are: W. L. Collins, Pittsburgh, and J. A. A. Hamilton, Cleveland, for 2 yrs.; and J. B. Kelly, Philadelphia, and O. A. Barber, Rochester, for 1 yr. each.

Previous to the election came the reports of the secretary, auditing, financial and constitution and by-laws committees. The latter committee's recommendation that of the four new directors to be elected this year, the two receiving the highest vote serve for 2 yrs. and the other two for 1 yr., was adopted, as well as that authorizing the retiring president becoming a member of the Executive Committee for the following year.

In response to an appeal for financial support, various city organizations, firms and individuals pledged sums totaling over $6000 to the support and management of the Fixture Dealers' Society. Just before the close of the meeting the members, as a token of appreciation, presented President Netting with a handsome victrola and a large floral bouquet.

It may be safely predicted that the fixture market has passed the $2,000,000 mark set as its goal when the market opened. The attending manufacturers and dealers went home satisfied of its success and with new ideas and energy for the business sure to come like the rising tide during 1921.

URGES EXTENSION OF VERMONT'S WATER POWERS.

The Vermont Hydroelectric Co. has recently been able to fill with water the new reservoir at its Glenn station located near Rutland, Vt., since the construction of the dam has advanced sufficiently for this to be done. The Jones & Lamson Machinery Co., Springfield, Vt., of which Vermont's new governor, James Hartness, is president, is one of the largest customers of the Vermont Hydroelectric Corp. Governor Hartness in his campaign, strongly urged the development of Vermont's industries and using the state's water powers to the best advantage. It is the general opinion that the position of the power companies will be greatly improved by his attitude.

EDITORIAL COMMENT

Distribution of Electrical Supplies

The trade, generally, recognizes that one of the most economical and proper channels of distribution of electrical supplies is through the electrical supply jobber to the contractor-dealer or other merchandiser, who, in turn, serves the consumer. By this method the contractor-dealer has the advantages to be derived from a complete stock of electrical goods in the warehouse of the jobber which can be drawn on at any time, no matter whether it is one item or a hundred, so that he is assured of prompt delivery and satisfactory service from every standpoint.

The jobber makes it his business to keep in close personal contact with the contractor-dealers in his territory, studies their wants and plans to serve their needs, no matter what these may be. Through the regular calls of his salesmen he is also enabled frequently to give valuable information, keeping contractor-dealers advised of the new lines of standard goods on the market and furnishing technical data or giving such other information as may be useful from time to time.

Furthermore, he is often able to be of service by carrying for reasonable periods contractor-dealers who have been tied up financially on account of delays in jobs owing to conditions over which they have had no control.

This kind of service cannot ordinarily be had where the contractor-dealers do business at long range and with producers who are not in close touch with their varied problems, although there may be exceptions where the manufacturer maintains a contractor-dealer service department and becomes practically a jobber himself. Few manufacturers have a volume of business or facilities for distribution sufficient to enable them to do this successfully.

The contractor-dealer is the natural channel for distributing various electrical devices to the consuming public. He carries the material in stock and displays it on his counters and in his show windows. The consumer is thus enabled to see the material which he is purchasing and knows that he is obtaining value for his money. He, in turn, can get promptly any information he needs or instructions in the use of the various electrical devices, which is a service that could not be rendered satisfactorily by correspondence with some distant point, and his position is analogous to that of the contractor-dealer towards the jobber.

Not all electrical apparatus can be handled successfully in this way and the heavier types will no doubt continue to be supplied directly by the manufacturers; but for the great range of standard electrical goods and specialties, including all domestic appliances, the most economical and satisfactory channel of distribution is usually through the jobber and the contractor-dealer.

Textbooks and Technical Journals

To the man of practice probably the most striking paradox offered by our technical schools is the air of finality which still pervades so many of their textbooks. If these books were used in subjects in which progress had practically ceased long ago, as, for example, in the case of a Latin grammar, this trait would be quite excusable. Indeed, a Latin grammar may be fairly up to date even after several decades. But in technical lines every year means decided progress in what has already been prominent, besides adding new developments and perhaps shifting the balance between different phases of each general line. To allow for this progress there must be an elasticity and an open mindedness towards the unforeseen developments which may follow within a few years, or even a few months, after a book goes to press. Logically, this precludes the rounding up of each subject with the finality which would be perfectly proper in any non-progressive line. No one should be more conscious of this than the college professor or instructor, whose standing depends to a considerable extent on the degree to which he keeps in touch with the steady progress in his own line and in others allied to it.

Yet a glance at some of the textbooks used in the electrical-engineering courses of our leading colleges will show that too few such men have learned the art of allowing for further developments in books written by them. In other fields, where progress comes with slower strides and where a revised edition every two or three years may take care of the changes, such a position may be justified. But in electrical subjects, where progress is not always reckoned by years, but often by months, this cannot hold. Indeed, it is difficult to understand such an attitude on the part of technical writers when we consider to what extent they must depend on the electrical journals and the published transactions of technical societies for keeping them abreast of the times. However, the timely articles with which every semi-annual volume of the electrical journals is crowded supply a wealth of the more de-

tailed information on various themes which the space limitations of a moderately priced textbook does not permit, and it is gratifying to note that such journals are being used more and more in keeping students abreast of the times. May this tendency increase.

Serving the Rural Customer

Those who have made a close study of utility matters unhesitatingly predict that the time is coming when nearly every central-station company will have to squarely face the problem of line extensions to serve the rural customer. Already, in some sections of the country the supply companies are being besieged by farmers with requests for service and this demand is rapidly growing in proportion. Certainly those companies which, in their wisdom adopt a clearly defined policy in connection with this business, will find their efforts well repaid.

One of the most striking features in connection with rural business obtained is the great variation in the practices and policies of the utilities supplying this business.

Practically all central-station companies are agreed that lines should be extended to serve farmers when the business conditions warrant it, but the question of whether the farmers should pay for the cost of building the line or whether this expense should be assumed by the company, seems to be the first stumbling block. Equity would seem to require that farmers pay for the cost of extensions necessary to serve them. The farmer of today fully appreciates the advantages of electric service and is willing and able to pay his share of the cost of obtaining service. Excellent results have been obtained where groups of farmers have been encouraged to incorporate and to arrange for service at wholesale rates, appointing a representative to read meters, make collections, etc. This practice seems to be one logical solution of the problem of serving the rural customer.

Other points which should be given serious consideration in connection with rural business are the matters of rates for service, core losses and adequate protection of the line.

Unless these items are given serious consideration, there is a possibility that the rural business will be found unprofitable because of the excessive investment required. However, a very encouraging feature in connection with the possibility of securing a large amount of farmer patronage at a profit should be found in the fact that many farmers are paying for individual lighting systems of one kind or another, and this investment represents much more than would be required were these farmers to form communities and arrange for service from the utility company. While central-station companies should have a thorough understanding of all features in connection with this business before making extensions, there is danger that if this is delayed too long they will be confronted with the same competition as is now encountered in urban communities, as isolated lighting plants and gasoline engines for farm service are increasing at a rapid rate.

Specialization

Most small and medium-sized factories concentrate all available capital in a particular and specialized operation, as it is always the rule that the profits from a given amount of capital employed in manufacturing increase in proportion to the degree of specialization which is followed. The generation, distribution and application of power is usually quite foreign to this manufacturing specialization and is essentially only an incidental means to an end. It is, therefore, unlikely that the same capital return will be realized from the powerhouse that is obtained from the production department. The greater the degree of specialization, the narrower the confines of the production department. This principle applies equally well to the production of power. With extensive duplicate and reserve equipment in the hands of specialists it is possible for the central-station company to supply reliable and economical service in adequate and sufficient amounts in a manner that would be impossible in the average manufacturing plant.

One Side to the Utility Question

"There is actually and fundamentally but one side to the utility question," says Paul P. Haynes, of the Indiana Public Service Commission. "The business of utilities is so completely and inextricably bound up with the public welfare that what is good for the utility is good for the public and what is not good for the public is not good for the utility. And when we begin to separate and distinguish between the public and utility, at that moment do we begin to injure both."

Date of First N. E. L. A. Convention

Through a curious error on the part of a compositor, in making a last-minute change of type to accommodate an illustration, the date of the first meeting of the National Electric Light Association was stated in C. W. Price's article, in the Feb. 19 issue of ELECTRICAL REVIEW, as Nov. 25, 1885. This meeting, to organize the Association, was held in Chicago Feb. 25, 1885. The second convention met in New York City in August of the same year.

THE WEEK'S NEWS

Reports of Important Meetings, Developments and Other Happenings of the Electrical Industry and Its Allied Interests

A. M. E. S. TO MEET IN NEW YORK CITY NEXT MONTH.

Officers, Committee Reports and Election of Governors Among Important Matters Scheduled for Annual Meeting of Association.

The sixth annual meeting of the Associated Manufacturers of Electrical Supplies will be held in room 119 of the Hotel Biltmore, Madison avenue and 43d street, New York City, March 15, at 2:30 p. m., for the presentation of reports of officers and committees, the election of governors in place of those whose terms expire by limitation, and for such other business as may be brought up at the meeting. The banquet, which for the last 5 yrs. has followed the annual meeting, will this year by unanimous vote of the Board of Governors be omitted.

In making this announcement, Charles E. Dustin, general secretary of the Association, states that "Business conditions are at the moment full of cross-currents and perplexing problems. Cancellation of orders, deflation of inventories and adjustment of labor conditions contribute to a feeling of uncertainty and a spirit of economy and retrenchment, all of which were considered by the Board in its decision to omit for this year the banquet. It was thought, however, in view of the very satisfactory summer meetings, that arrangements might be made for enlarging the scope of the June meetings to include the attendance of the ladies and to provide entertainment which, to a great extent, would take the place of the annual banquet."

In accordance with the by-laws of the Association, the Nominating Committee, of which R. E. Gallaher is chairman, has submitted the following nominations for governors to be elected at the annual meeting, to take the place of members of the Board whose terms expire by limitation: S. H. Blake, General Electric Co., Schenectady, N. Y.; F. L. Bishop, Hartford Faience Co., Hartford, Conn.; A. H. Englund, Electric Service Supplies Co., Philadelphia; A. F. Hills, Crouse-Hinds Co., Syracuse, N. Y., and Robert Kuhn, American Electrical Heater Co., Detroit.

The following is a schedule of meetings to be held during the week of the annual meeting at the offices of the Association, 30 East 42d street, New York City, and at the rooms of the Old Colony Club in the Hotel Biltmore:

Tuesday, March 15—Fuse section and the electrical porcelain section at 9 and 10:30 a. m., respectively, in the association rooms.

Wednesday, March 16—Fan motor, outlet box and industrial lighting fixture sections at 10 a. m. in the Old Colony Club. Snap switch, signalling apparatus, lamp receptacle and socket, attachment plug and line material sections in the association rooms, the two former at 10 a. m., the attachment plug section at 4 p. m., and the other two at 2 p. m.

Thursday, March 17—Rigid conduit, nonmetallic conduit and armored conductor sections in the Old Colony Club at 10 a. m., 2 p. m., and 4 p. m., respectively. Moulded or formed insulation, heating appliance and knife-switch sections in the association rooms, the first two at 10 a. m. and the latter at 2 p. m.

Friday, March 18—Panelboard and switchboard and air circuit-breaker sections will meet in the association rooms at 10 a. m. and 2 p. m., respectively.

DELAWARE RIVER TO BE DEVELOPED ON BROAD SCALE.

States of New Jersey, Pennsylvania and New York to Be Supplied With Power From Chain of New Plants.

If plans, now in active preparation by Paul T. Brady of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., are successfully carried out, the Delaware river will be harnessed in the near future and its power, which amounts to almost 1,000,000 hp., will be at the service of the inhabitants of New Jersey, northeastern Pennsylvania, southern New York, Philadelphia and New York City. Mr. Brady's plan is ambitious but entirely practical. It represents the results of many years' work on the part of prominent engineers and financiers as well as his own personal investigations, and is therefore based upon the complete knowledge of the facts. Probably it would have been realized several years ago had not the war intervened. Its cost, which will be in the neighborhood of $200,000,000, is justified by the fact that at least 5,000,000 hp. could be readily sold in the great industrial district that can be served.

The Delaware river in many places is very swift, and by building a series of dams at certain places such as Belvedere, Bushkill, Shohola and Butler's Rift the rapids can be transformed into waterfalls with an average head of 80 ft. each. When all of the projected dams and powerhouses are built their combined capacity at high water will be about 500,000 kw., or 750,000 hp. At low water, however, the capacity of the hydroelectric plants will be considerably less, so that an important part of the project will be the erection of a 125,000-hp. steam plant somewhere in New Jersey, which will be used during seasons of decreased water flow to insure a continuous power supply.

A number of important benefits will result from this undertaking. Many sections of this territory are short of power owing to the greatly increased use of electricity by industries, and power companies have requests for electric service totaling over 100,000 hp., which they cannot fill for lack of capacity. Consequently the addition of this new source of supply to the power

resources of this district will add materially to its prosperity.

GREAT SAVINGS OF COAL ANTICIPATED AS RESULT OF HYDROELECTRIC DEVELOPMENT.

An important advantage arising from this project is the immense amount of fuel it will save. It takes about 2 lbs. of coal to develop a horsepower for 1 hr. When, therefore, this 750,000 hp. is generated by the inexhaustible power of water the total savings for this district will be in the neighborhood of 2,000,000 tons of coal annually. In addition, the transmission of this power will be independent of the many obstacles that may interfere with the delivery of coal, so that the effects of a fuel famine will be greatly mitigated, if not eliminated, in the district served.

When the work is finally completed, the upper waters of the Delaware will be converted into a series of quiet stretches which will be ideal for boating, fishing, swimming and all other river sports. The well-built dams will add to the natural beauty of the river valley, and business will be stimulated throughout the entire region.

Mr. Brady has on file applications covering practically all of the suitable power sites, and these are grouped under the title of "Project No. 22" in the Federal Power Commission's file. Approval of this project will be the signal for the commencement of active operations.

The first step will be the erection of the steam plant and one, or more—probably two—of the water-power plants. This work is expected to take about two years, so that probably about 300,000 hp. will be available by Jan. 1, 1923.

Mr. Brady has had wide experience in the development of water powers. He is vice-president of the Archbald-Brady (Power) Co. of Syracuse, and the Corning Light & Power Corp., and has also been prominently connected with the Westinghouse Electric & Manufacturing Co. for nearly 30 years. Associated with him in this project are Duncan, Young & Co., New York City, the L. B. Stillwell Engineering Co., New York City, and the engineers of the Westinghouse Electric & Manufacturing Co. He has been interested in the development of the Delaware river for many years, and has gradually gathered together all of the rights, surveys and other assets of the various interests which have seriously considered this same project and have spent a total of about $1,000,000 in preliminary work.

Mr. Brady is at present working in an individual capacity, but a large corporation will take over the entire project as soon as circumstances make this step feasible.

CONTRACTOR-DEALERS OF PENNSYLVANIA MEET.

Senator Cartwright, of California, Gives Inspiring Talk on Lessons From Panics of the Past and Ways of Curing Pessimism.

At the recent annual meeting of the Pennsylvania State Association of Contractors and Dealers, in Philadelphia, which was attended by 163 members, one of the features was an address by Senator George W. Cartwright, of California, on "Lessons From Panics of the Past."

R. W. Keck, Allentown, Pa., was selected by the Executive Committee as chairman of the association for the ensuing year. George Barrows, of Barrows Electric Shops, Inc., Pittsburgh, was chosen vice-chairman. Three new members of the Executive Committee elected by the association are Messrs. Keck and Barrows, and Joseph G. Crosby, of the Whelan-Crosby Co., Inc., Philadelphia.

Senator Cartwright stated that he was now devoting all his time to discussion of industrial and economical relations between capital and labor, and between the law-respecting citizen and the radical socialist. He has been addressing assembled employes in industrial plants in the hope of improving these relations and paving the way for a better understanding. Some of the main points brought out by Senator Cartwright follow:

All panics hinge on some stress on the existing credit system and start at the seat of greatest financial activity. China has been affected least of any of important nations by such panics because of its commercial isolation. France has been affected next least of the commercial nations, followed closely by the United States.

Over 40% of the productive energy of the world is located in the United States. The world war took the place of a panic that was imminent in 1913-1914. Wartime production stimulation postponed the readjustment period to the present time. He predicts in spite of the magnitude of the war and accompanying necessity for readjustment that business confidence will be restored in the United States quickly—how quickly will depend upon the efforts and confidence of the individual, particularly the wealthy man who reinvests his capital in industrial enterprises.

Unemployment must be avoided as far as possible, as every employed man is a purchaser; 90% of all industrial products are purchased by wage earners. The right of each man to work out his own success must be maintained insofar as it does not conflict with similar rights of others. This has a decided bearing on the question of panics as attempted political reforms have always preceded panics.

Two fundamental causes of panics are the gambling spirit of man in general and the natural tendency to over-expand resulting from the credit system, and stimulated by temporary success. Deflation induced by some crisis producing lack of confidence brings the panic. The wealthy man can't wear or eat appreciably more than the wage earner. Ambition leads to accumulation of wealth which is reinvested in labor, and the cycle is repeated. Limiting accumulation limits ambition and relatively starves the community.

Employers must be educated to deal fairly with employes. The development of employes individually and as a body is directly reflected in the success of the business. Dividing of wealth of any one man would mean conversion of industries in which his wealth is invested, thereby disarranging those industries and probably causing unemployment for hundreds of thousands of employes.

In order to determine each man's share of such a division an army of bookkeepers and accountants would be required. They would not work for nothing. Schwab did not have time to work out such a bookkeeping system before launching ships and is being criticised for some appar-

ent irregularities that might have been avoided by delaying production.

Gilbert S. Smith, of J. F. Buchanan & Co., Philadelphia, pointed out that it was more difficult to become a leader than to become a contractor because of the additional merchandising business sense and capital required. He emphasized the value of a high-rent store location, attractive window display, and clean, well-arranged stock. He recommended specialization to the extreme in stock carried and the closest possible tie-up between the contractor-dealer and the distributor whose line he is pushing. The importance of maintaining credit, standing by prompt payment of bills was especially urged. He recommended close consultation with the local banker, particularly in financing installment sales. Mr. Smith also pointed out the value of consulting with the editors of local papers regarding editorial co-operation in the form of electrical pages, etc.

At a meeting of the Executive Committee which preceded the convention, the draft of a proposed bill to be presented to the state legislature was adopted. This bill, in reality an extension of a statute protecting motors, generators and fans from seizure for debt while under lease or rent, is intended to apply more specifically to household appliances procured on time payment, the title of which is still in the name of the dealer. The proposed bill is as follows:

> To exempt electric washing machines, electric vacuum or suction cleaners, electric iron machines or mangles, electric dish washing machines, electric sewing machines, electric portable lamps, electric refrigerating machines, electric sad irons, electric vibrators, electric heaters, electric ranges or electric water heaters, leased or hired, from levy or sale on execution, or distress for rent.
>
> Section 1. Be it enacted, etc.: That hereafter all electric washing machines, electric vacuum or suction cleaners, electric ironing machines or mangles, electric dish washing machines, electric sewing machines, electric portable lamps, electric refrigerating machines, electric sad irons, electric vibrators, electric heaters, electric ranges or electric water heaters, leased or hired by any person or persons residing in this commonwealth, shall be exempt from levy and sale on execution, or distress for rent, due by such person or persons so leasing or hiring any such electric washing machines, electric vacuum or suction cleaners, electric iron machines or mangles, electric dish washing machines, electric sewing machines, electric portable lamps, electric refrigerating machines, electric sad irons, electric vibrators, electric heaters, electric ranges or electric water heaters, in addition to any article or money now exempt by law:
>
> Provided, That the owner or owners of such electric washing machines, electric vacuum or suction cleaners, electric ironing machines or mangles, electric dish washing machines, electric sewing machines, electric portable lamps, electric refrigerating machines, electric sad irons, electric vibrators, electric heaters, electric ranges or electric water heaters, or his or their agent, or the person or persons leasing or hiring the same, shall give notice to the landlord or his agent, within ten days after such instrument or apparatus is placed upon the demised premises, that the instrument or apparatus is leased or hired.

J. F. Buchanan, of J. F. Buchanan & Co., Philadelphia, National Executive Committeeman from Pennsylvania, reported informally on some of the subjects discussed at the recent meeting of the National Executive Committee. He pointed out the desirability of taking up through the State Executive Committeeman all matters beyond the scope of the State Association. Such subjects as relations with other associations of the electrical industry, including better co-operation between central-station commercial departments and contractor-dealers, were suggested as typical for such treatment.

Washington Devereux, chief of electrical department, Philadelphia Fire Underwriters' Association, spoke forcibly on the benefits already derived and yet to be derived from co-operation between the contractor-dealers and the Underwriters' Association. Conferences are being held at short and regular intervals at which not only the employing contractor-dealers and underwriters' inspectors, but also Mr. Devereux himself, inspectors and other representatives of the Philadelphia Electric Co. and the individually employed electrician and wireman get together and discuss questions of interest in the proper handling of electrical wiring and construction work. These conferences have produced a condition of harmonious agreement between all these interests worthy of imitation in other localities.

Chairman Fred R. Smith next introduced George Maertz, publicity representative, as the speaker on "Better Merchandising Methods." Mr. Maertz covered the subject from the locating of the store and buying of goods to the service policy. He pointed out the immensity of the field due to increased incomes, particularly on the farm. Merchandising, he said, consisted of buying, displaying, selling and service, and no one factor could be disregarded without affecting the degree of success. The dealer should judge his success not so much on gross profit per sale as on the turnover times the net margin of profit. Electrical appliances can frequently be sold by association of ideas, he said, rather than as a manufactured product at such a price; for example, with washing machines the ideas to sell would be clean clothes, undamaged clothes, time saving for the housewife and freedom from worry about the laundress, etc.

As show windows are frequently valued at from $35 to $50 per day, the contractor-dealer should see that his show windows are trimmed in harmony with the goods displayed and the space should not be crowded in an attempt to display the entire stock. Rather the stock should be so located that the specialties would run from the show window well back into the store where the staples should be kept. Attractive show cases, display cabinets, etc., should prove worth while.

Mr. Maertz said the question of display cards and price tags on goods in the show window was debatable, but he recommended doing this with at least one or two appliances to give the passers-by a general idea of the range of prices. He also recommended that the display should tie up with events of local or national importance, such as holidays, local hospital tag days, baby weeks, etc.

The question of store location should receive very careful consideration, and in general, should be decided in favor of the higher rent, more traveled thoroughfares in the path of the woman shopper, as approximately 85% of all such purchases are made by the housewife. Other factors of importance are courtesy and attentiveness of salesmen, orderly stock and demonstration of quality of the stock.

Too little attention is paid to costs and the

contractor-dealer does not in general know his unprofitable lines. In conclusion, Mr. Maertz emphasized the necessity for advertising in which the co-operation of the manufacturer could be counted on for dealer helps and suggestions for newspaper advertisements, car cards, posters, lantern slides, circular letters, etc.

Discussion followed in which H. G. Kepler, of Walker & Kepler, Philadelphia, Albert Gentel, of the Calebaugh Self Lubricating Carbon Co., Philadelphia, R. W. Keck, of R. W. Keck & Co., Allentown, J. F. Buchanan and others participated. The advisability of the contractor-dealer stocking more than one line of the same general type of appliance had advocates both ways, but the majority favored the single line as representing the contractor-dealer's best judgment for his clientele.

In the discussion of advertising by the contractor-dealer, it was brought out that only 0.9% of the gross business of the electrical industry for 1920 was spent for all kinds of publicity.

The breakage of glassware was also discussed as one of the greatest annoyances in the contractor-dealer's business. It was recommended that a suitable resolution should be sent to the Illuminating Glassware Guild strongly urging adequate packing of glassware, in individual cartons if possible. It was also recommended in general that all shipments should give name of shipper and customer, and customer's order number for ready identification and checking.

OKLAHOMA UTILITIES ASSOCIATION TO MEET.

The third annual convention of the Oklahoma Utilities Association will be held March 8-10 in Oklahoma City, Okla., with headquarters at the Huckins Hotel. The association is made up of electric light, electric railway, gas, telephone companies and manufacturers and dealers in public-utility supplies. It is expected that between 300 and 400 delegates and visitors will be in attendance, and it is planned to have a large number of exhibits. Among those who will address the convention are the following: Paul P. Haynes, Indianapolis, member of the Indiana Public Service Commission; Campbell Russell, chairman of the Oklahoma State Corporation Commission; Luther Harrison, Ada, Okla., state senator and editor of the *Ada News;* H. P. Wright, president of the H. P. Wright Investment Co.,, Kansas City, Mo.; H. J. Gordon, publisher of the *Public Service Magazine,* Chicago, and C. C. Deering, secretary of the U. S. Independent Telephone Association, Des Moines, Ia.

UTILITY BOARD REMOVED BY COURT OF ERRORS.

By a vote of 7 to 6, the Court of Errors and Appeals of New Jersey has affirmed a decision of the Supreme Court, Feb. 15, upholding Governor Edwards in his action in removing the members of the Board of Public Utility Commissioners from office. The decision removes all question as to the legal status of the four commissioners, who have continued to act since last September, despite the governor's action. The legislature has passed a bill creating a public utility commission for the state of three members, instead of five, as heretofore, with a salary of $12,000 a year each. The bill has gone to the governor for approval or veto. At the same time the senate has before it the governor's five nominations to the board, as created under the Utilities Act of 1911. In connection with the dissenting opinions in the case by members of the Court of Errors and Appeals, Justice Kalisch holds that the Utility Act of 1911 is unconstitutional, as it attempts to give the state executive the right to exercise a judiciary power, which is vested only in the courts by the fundamental laws of the state.

SCHENECTADY SECTION, A. I. E. E., HOLDS MEETING.

The 234th meeting of the Schenectady (N. Y.) section of the American Institute of Electrical Engineers was featured by an illustrated talk by C. J. Blanchard, statistician of the U. S. Reclamation Service Department of the Interior, on "Making the Desert Blossom." The speaker showed by means of colored slides and motion pictures made under his personal direction, the more interesting and spectacular features of the great development of the American desert by hydraulic and electrical engineers.

G. E. MERCHANDISING CONFERENCE PLANS FOR 1921.

Enterprise Conducted to Show Dealers Extent of Field for Electrical Merchandise—March Itinerary Includes Six Cities.

The Merchandising Conference for 1921 which, under the auspices of the General Electric Co. and seven allied or affiliated companies—Duplex Lighting Works of General Electric Co., Edison Electric Appliance Co., Edison Lamp Works of General Electric Co., Electric Vacuum Cleaner Co., Hurley Machine Co., Ivanhoe Regent Works of General Electric Co., and the Sprague Electric Works of General Electric Co.—is touring the country, is now on its second trip. The itinerary for next month includes the following cities: March 2-3, Houston, Tex.; March 4-7, Dallas, Tex.; March 9-10, Kansas City, Mo.; March 11-12, St. Louis; March 14-15, Indianapolis, and March 16-17, Cincinnati. The first conference of the second itinerary was held at Washington, Feb. 16-17, followed by others at Jacksonville, Fla.; Atlanta, Ga., and Birmingham, Ala. The schedule calls for a conference at Memphis, Tenn., Feb. 25-26, and at New Orleans, Feb. 27-March 1.

On the first trip, New York, Philadelphia, Pittsburgh, Columbus, Cleveland, Toledo, Buffalo, Rochester and Syracuse were visited. The total attendance in those cities is estimated to have been about 6000. These conferences have been characterized by marked interest and enthusiasm wherever they have been held and have left a spirit of confidence, optimism and activity among those who have attended.

They are a liberal education in merchandising methods, including salesmanship, window-trimming and advertising. Back of the enterprise is a broad-gage policy of calling the attention of

dealers not so much to specific products as to the great and increasing field for electrical merchandise in general, and of urging them to take advantage of the opportunity presented by the general popular interest in electrical matters to educate the public in regard to the wide range of electrical appliances for everyday use, including the broad field of lighting. The conferences are arranged through the jobbers in the cities visited.

CENTRAL STATION COMPANY SHOWS STEADY EXPANSION.

The Pacific Gas & Electric Co., San Francisco, has experienced a steady growth in business during the past 13 years, as indicated by the number of customers served. In 1917 there were 52,666 customers receiving electric service from the lines of the company, and in 1920 there were 262,705 customers. Each year has shown a substantial increase over the previous year, the growth being more rapid lately than formerly.

SERVICE CONNECTED TO DISTRIBUTION LINES OF PACIFIC GAS & ELECTRIC CO.

Year.	Service.
1907	52,666
1908	60,164
1909	68,318
1910	81,050
1911	97,207
1912	113,571
1913	128,871
1914	145,278
1915	163,577
1916	176,131
1917	191,449
1918	206,584
1919	226,286
1920	262,705
Total increase	210,039

ILLINOIS UTILITIES TO DINE.

In connection with the joint meeting of the Illinois State Electric Association, the Illinois Electric Railways Association and the Illinois Gas Association, to be held at the Sherman House, Chicago, March 15-17, the entertainment committee, of which Charles A. Luther is chairman, has arranged for a banquet on the evening of March 16. On this occasion the presidents of the three utility associations will address the gathering, in addition to other prominent speakers. The entertainment features will be provided by Benson, and some special numbers are billed for the amusement of the delegates and visitors to the convention.

SAFETY ENGINEERS MEET.

"Safety to Life in Ship Construction and Operation" was the subject discussed at the Feb. 25 meeting of the American Society of Safety Engineers in the Engineering Societies building, New York City, four papers being presented covering various phases of the subject. At the March 25 meeting "Structural Demolition" is to be discussed.

A. S. M. E. TO MEET IN CHICAGO.

The spring meeting of the American Society of Mechanical Engineers will be held May 23-26 at the Congress Hotel, Chicago. Sessions are planned by the professional sections on aeronautics, fuels, management, material handling, machine shop, power, forest products and railroads.

ELECTRIC CLUB HOLDS "STAG."

The Electric Club of Chicago held a "stag" Feb. 23 in the Cameo room of the Morrison Hotel, covers being laid for 300. Dinner was served at 6 o'clock, the entertainment features being staged at 8 p. m. The party was one of the most successful the Electric Club has ever given.

COMING CONVENTIONS.

Oklahoma Utilities Association. Annual convention, Oklahoma City, Okla., March 8-10. Headquarters, Huckins Hotel. Assistant manager, O. D. Hall, 1107 First National Bank building, Oklahoma City.

Associated Manufacturers of Electrical Supplies. Annual convention, New York City, March 15. Headquarters, 30 East 42d street, New York City. General secretary, Charles E. Dustin, Hartford, Conn.

Electrical Supply Jobbers' Association. Quarterly meeting of Atlantic Division, New York City, March 15. Headquarters, Hotel Commodore. Secretary, E. Donald Tolles, 52 Broadway, New York City.

Joint meeting of Illinois State Electric Association, Illinois Electric Railways Association and Illinois Gas Association, Chicago, March 15-17. Headquarters, Sherman House. Secretary, R. V. Prather, Springfield, Ill.

American Washing Machine Manufacturers' Association. Meeting at Sherman Hotel, Chicago, March 16-17. Secretary, Enoch B. Seitz, Otis building, Chicago.

Wisconsin Electrical Association. Annual convention, Milwaukee, March 22-24, jointly with the Wisconsin Gas Association. Secretary, J. P. Pulliam, 1408 First Wisconsin National Bank building, Milwaukee.

Kansas City Electrical Show. First annual electrical exposition, Convention Hall, Kansas City, Mo., April 18-23. Manager, Sam Furst, Electrical Trades Exposition Co., 802 Broadway, Kansas City, Mo.

American Electrochemical Society. Spring meeting, Atlantic City, N. J., April 21-23. Headquarters, Hotel Chalfonte. Secretary, Joseph W. Richards, Lehigh University, Bethlehem, Pa.

American Society of Mechanical Engineers. Spring meeting, Chicago, May 23-26. Headquarters, Congress Hotel. Assistant secretary, C. E. Davies, 29 West 39th street, New York City.

Electrical Supply Jobbers' Association. General meeting, Hot Springs, Va., May 25-27. General secretary, Franklin Overbaugh, 411 South Clinton street, Chicago.

Pacific Coast Geographic Division of the National Electric Light Association. Annual convention, Del Monte, Cal., May 25-27. Headquarters, Hotel Del Monte. Secretary, L. H. Newbert, 445 Sutter street, San Francisco.

National Electrical Light Association. Annual convention, Chicago, May 31-June 3. Headquarters, Drake Hotel. Executive manager, M. H. Aylesworth, 29 West 39th street, New York City.

North Central Electric Association. Annual convention, Duluth, Minn., June 14-16. Secretary, H. E. Young, 15 South Fifth street, Minneapolis, Minn.

Tri-State Water and Light Association. Annual convention, Asheville, N. C., June 15-16. Secretary, W. F. Steiglitz, Columbia, S. C.

National Fire Protection Association. Annual convention, San Francisco, June 14-16. Secretary, Franklin H. Wentworth, 87 Milk street, Boston.

American Institute of Electrical Engineers. Annual convention jointly with the Pacific Coast convention, Salt Lake City, Utah, June 20-25. Secretary, F. L. Hutchinson, 33 West 39th street, New York City.

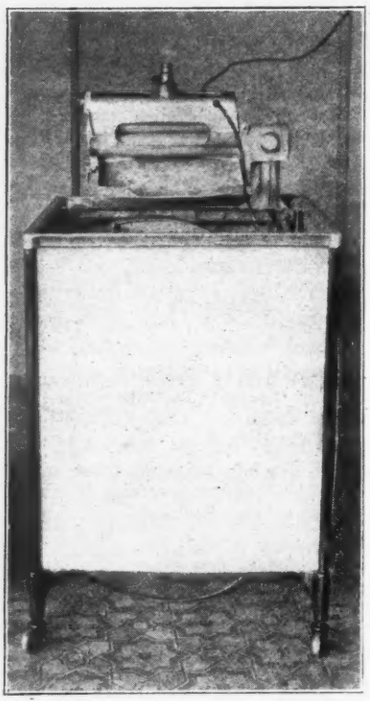
National Association of Electrical Contractors and Dealers, Anniversary convention, Buffalo, N. Y., July 20. Secretary, W. H. Morton, 110 West 40th street, New York City.

APPLIANCES and DEVELOPMENTS

New, Improved or Interesting Electrical and Mechanical Apparatus and Devices, and Applications of Equipment and Methods in Practice

Laundry Queen Cabinet Electric Washing Machine.

The "Laundry Queen" electric washer being placed on the market by the Grinnell Washing Machine Co., Grinnell, Ia., represents a new departure in the manufacture of washing machines. The most unique of its distinctive features is the drop-head wringer, made of highly polished aluminum, which sinks into the cabinet and out of sight when not in



Laundry Queen Electric Washer.

use. A slight touch brings it up to working height again. The wringer swings to any position, with the rolls turning either way, and on top of it is mounted an electric light which insures a plentiful supply of light always over the work. Being of the automatic-safety type, a touch on the small lever at the side causes the top roll to jump away from the lower one, and a simple downward pressure on the upper half of the wringer restores the compression instantly.

The oscillating washer is made of heavy tin-lined copper with an unusually large capacity, allowing an ordinary family washing to be handled at one time without danger of overloading. With every movement of the oscillator a double cascade of water surges through the clothes. When movement ceases the opening of clothes container is always uppermost.

A feature of this new machine is the remarkable beauty of its appearance. The nickeled corner columns of the cabinet lend an impression of strength and sturdiness, yet blend with the general color scheme of old ivory and silver slightly relieved by the delicate tints in the tracery of the panels. The "Laundry Queen" embodies an unusual combination of the beautiful and the practical. A handsome and attractive cabinet has been achieved without sacrificing sturdiness of construction and simplicity of design.

Electrical Device for Household and Hotel Use.

A labor-saving device for beating eggs, creams, batters, salad dressings and the like has recently been invented and placed on the market by the Kollins Kitchen Kraft, which has established sales offices at 501 Monadnock block, Chicago. The device is marketed under the name of the "Kollins" electric egg beater, and in addition to the uses already enumerated it can be used in the preparation of light batters, such as waffles, sponge cake, omelets, fritters, griddle cakes, sauces, icings, and many other cooking recipes where thorough mixing or beating is required. The manufacturer states that one feature of the device is that where cream and utensils are sufficiently cold the egg beater will attain satisfactory results with the use of a lower percentage of whipping cream than that usually sold for this purpose.

In regard to the construction of the "Kollins" electric egg beater, it is stated that the handle is stamped from cold rolled steel and is heavily ribbed to establish rigidity. The gear box, or housing, is a specially designed aluminum casting which contains a train of four bronze gears. The shafts are of hardened tool steel, revolving in Tobin bronze bearings. The blades are firmly braced and guided by a heavy steel rod which is bolted by adjusting nuts onto the aluminum gear housing. The blades are made of semi-spring steel and heavy enough to withstand a long period of service. The hollow bearing at the bottom of the blades is also made of bronze, its wear being consistent with all other parts. The entire instrument is heavily plated, which adds to its appearance and protects it from rust.

"Kollins" Electric Egg Beater.

In detaching the motor from the beater, the motor should be held firmly in the left hand and given a quick upward movement. The lug attached to the motor will slide out of its tapered slot in the handle toward the opening at the top and readily disengage. The lever at the top of the motor controls the starting, stopping and several speeds of the beater. These speeds are provided in order to accommodate the rapidity of the revolutions to the consistency of the various foodstuffs, the heavier substances requiring greater power than the lighter commodities. When the beating operation is completed the current should be turned off at the wall socket and the motor should be at once detached from the beater and carefully laid on the table. The complete instrument weighs 2.75 lbs.

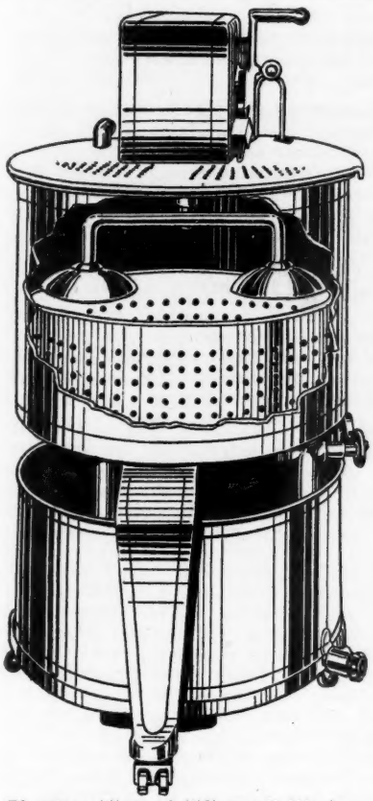
The "Kollins" electric egg beater is made in two sizes for household and hotel and restaurant use. The household article is intended for use in more shallow bowls and for beating a smaller quantity of foodstuffs at one time, whereas the other size is a larger appliance suitable for deeper and larger receptacles and for use with greater amounts of material.

Vacuum and Suction Principle Used in Clothes Washer.

An electric vacuum clothes washer, known as the "Klymax," which is claimed to do all the washing, sterilizing, rinsing and wringer-drying without handling the clothes, is being manufactured by the Home Utilities Co., 320 North May street, Chicago. In describing this machine the manufacturer states that it operates on the vacuum and suction principle. The vacuum cups on the down-stroke press the steaming, soapy water through the mesh of the garments, and on the up-stroke the cups suck the soapy water back, thereby creating a continuous circulation of soapy water through the mesh. The "Klymax" washes everything from the most delicate fabric or lace curtains to blankets and heavy rag rugs. The machine is equiped with a gas heater, which makes a separate boiling unnecessary, sterilization taking place as the clothes are washed. In rinsing, the clothes are not handled or removed from the machine. By opening a faucet the soapy water is allowed to run into the reservoir below, following which fresh clean water is turned on and the machine rinses the clothes. While rinsing the rinse water is allowed to run off into the drain without disturbing the soap

suds, which can be used for the next tub of clothes. After the rinsing is finished the clothes are wringer-dried by centrifugal motion.

Among the features of the "Klymax" the manufacturer mentions the following: Metal construction throughout; all parts coming in contact with water and clothes are made of aluminum, copper and brass; all bearings are fitted with bronze graphite bushings and the machine is equiped with ball-bearing casters and standard 0.25-hp. motor; the dimensions of the machine are 26 ins. diam. and 42 ins. high; a cord connects with any electric light socket; the capacity of the machine is six sheets or the equivalent. All moving parts are encased, there being no danger of soiling the clothes or causing injury to operator or children. The machine is protected against overloading by automatic adjustment, and is equiped with belt drive.



Phantom View of "Klymax" Washer.

Radio Station on Long Island for Coastal Service.

Achievements in recent years in radio engineering warrant the belief that we are now entering the radio age. Telephone conversations half way around the world, the navigation of ships, the direction of the movement of airplanes from a central station, the communication with submerged submarines, all by means of radio equipment presages wonderful achievements yet to come. Alive to the practical needs the Cutting and Washington Radio Corp., New York City, has just opened up a new commercial radio coastal station at Easthampton, Long Island. The location of this station was the first important consideration for the company's engineers, and Easthampton was decided upon only after most careful study of the necessities of ships entering and leaving New York harbor. It was found that with the great number of vessels coming into and leaving the harbor great difficulty was experienced in handling the radio traffic, and it seemed advisable to locate a station at a point sufficiently distant from the city to avoid interference and at the same time near enough to arrange all details of docking, transmitting of commercial messages, and allowing ample time for making up of abstracts and other details of accounting.

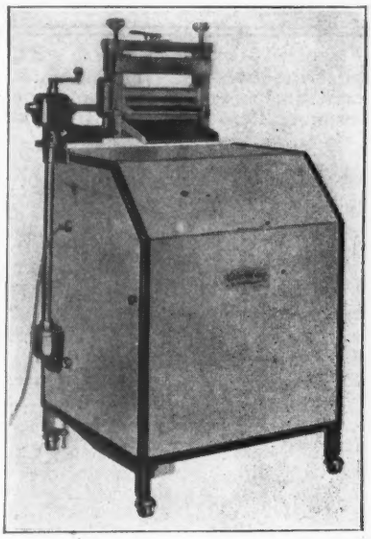
Direct telephone and telegraph wires to New York City, together with a selected corps of experienced operators, were arranged for to insure accurate and speedy transmission of all messages sent through this station, the call letters of which are WSA.

Latest developments in antenna and counterpoise are used, the antenna being of the cage type found so efficient on battleships during the war; the counterpoise is a series of wires radiating from one corner of the radio building and practically covering six acres. The power supply is obtained from the local electric light company and is brought to the station in a conduit 1200 ft. long. Alternating current energy at a pressure of 2200 volts is stepped down to 220 volts from which a motor-generator unit produces the 100-volt direct current to be used in the operation of the radio set. One of the well-known Delco light units in conjunction with a storage battery is used as an auxiliary to provide against breakdown.

The radio "shack" is equipped with hot-water heating, shower and toilet facilities, rest room for operators off duty, and complete office equipment for handling the clerical work necessary at the station. This station is said to be one of the most complete and thoroughly equipped stations of its kind in the country, and will no doubt for some time to come occupy the leading position among commercial coastal radio stations.

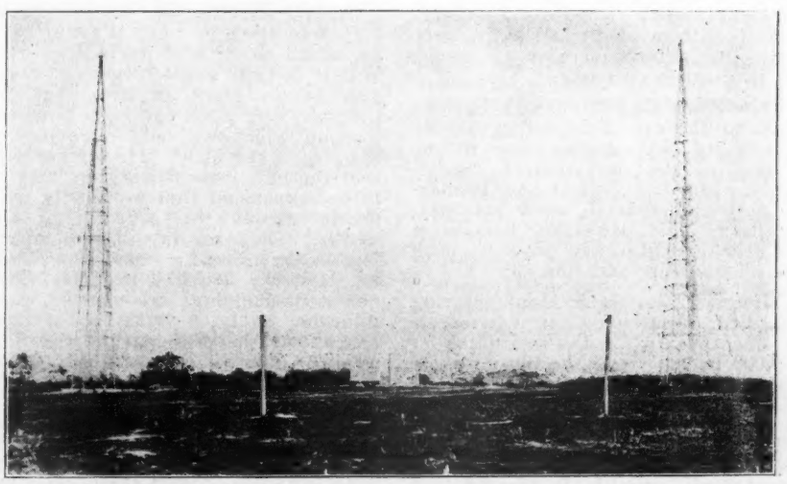
"Air-Way" Electric Clothes Washing Machine.

The "Air-Way" electric washer, being placed on the market by the Air-Way Electric Appliance Corp., Toledo, O., is a machine of the oscillating type completely inclosed in a cabinet of duo-tone ivory finish with black striping. Although the washer occupies a comparatively small floor space it has a 12-sheet capacity. It is built compactly, and contains many new and interesting features according to the manufacturer. One of the special advantages of this washer is the novel cleansing method called "The Air-Way." Built into the copper tub is a false bottom which rises in steps in pyramid form. Along the outside step are perforations which, when the tub is in motion, allow the water to rush through the holes. The weight of the water plus the air pressure accomplishes the results.



Washing Machine Having 12-Sheet Capacity.

Careful investigations have disclosed the fact that the drain of a washing machine is often as important as other features. In the "Air-Way" washer particular attention has been given to both the location and size of the drain. The drain in this machine has a 1.5-in. opening located at the lowest point in the tub, so that all water is completely drained off when the cock is opened. Other points of merit include the oilless bearings and a device which anchors the machine to the floor. The machine is completely gear driven by a special motor which develops 0.25 hp. and operates at a speed of 1700 r.p.m.



General View of Easthampton Radio Station Located on Long Island.

ACTIVITIES IN THE TRADE

Business Developments, Sales Agencies, Trade Literature and Miscellaneous Items Concerning Electrical Manufacturers and Allied Business Interests

Delta Electric Co., Marion, Ind., manufacturer of electrical equipment, has increased its capital stock to $165,000.

Splitdorf Electrical Co., 2900 South Michigan avenue, Chicago, plans to erect a 6-story plant building in Cicero, Ill.

Runzel Lenz Electric Manufacturing Co., 1751 North Western avenue, Chicago, plans to erect a 2-story addition to its factory.

M. W. Kellogg Co., West Side avenue, Jersey City, N. J., manufacturer of power plant specialties, sustained a loss by fire Feb. 7.

Oriole Electric Manufacturing Co., Norwalk, Conn., has filed notice of change of name to the King-Craymer Electric Manufacturing Co.

Blaw-Knox Co., Pittsburgh, has taken a contract from the Nippon Electric Power Co., Osaka, Japan, for a number of steel transmission towers.

Hardinsburg Electric Co., Hardinsburg, Ky., has arranged for an increase in capital to $10,000 for proposed expansion. A. Y. Taylor is head.

Cutler-Hammer Manufacturing Co., Milwaukee, held its annual theatre party of the Fife, Drum and Bugle Corps, at the Majestic theatre, Monday evening, Feb. 7.

Springfield Boiler Co., Springfield, Ill., an Illinois corporation, has filed notice of organization to operate in New York. H. S. Gould, 37 Wall street, is representative.

Hart & Hegeman Manufacturing Co., Hartford, Conn., manufacturer of electrical switches, etc., has filed notice of increase in capital by $84,000, making a total outstanding stock of $105,000.

Boonton Rubber Manufacturing Co., Boonton, N. J., has just issued a booklet entitled "Boonton Bakelite." It deals with molded material for electrical insulations, mechanical, chemical and other purposes.

Blaw-Knox Co., Pittsburgh, has announced the establishment of a new branch of its organization to be known as the development department, with O. D. McArthur, formerly assistant general sales manager, in charge. Mr. McArthur will direct the development of new products, both for manufacture and sale.

Minimax Electric & Manufacturing Co., Ltd., Montreal, Can., was recently incorporated with a capital of $99,000 to take over the business and plant of the the Minimax Electric & Manufacturing Co., manufacturer of electrical apparatus, measuring instruments, dynamos, motors, etc. Among those interested in the new company are Albert G. Smith, P. Marraza and William F. Cleaver.

Cook Electric Co., Greenfield, Mass., manufacturer of electrical products, is being reorganized. Charles I. Cook has disposed of his interest to C. E. Parsons, who will head the company in the future.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, has issued an eight-page house organ called "The Safety Switch," for the employes of its Krantz Works at Brooklyn. This publication will be issued each month.

American Insulator Co., New Freedom, Pa., is taking bids for the erection of its proposed local plant on Main street for the manufacture of electrical insulation products. It will be two-story and is estimated to cost about $75,000. E. A. Barth is engineer.

Farley & MacNeill, 107 Federal street, Boston, electric fixtures and supplies, have leased the 5-story building at 62-64 Stanhope street, corner Clarendon street, comprising about 16,000 sq. ft. of floor space, for a new plant for the manufacture of storage batteries.

Maring Wire Co., Muskegon, Mich., manufacturer of cotton-covered and enameled magnet wire, has announced the appointment of the Beedle Equipment Co. as its representative. The Cincinnati office at 1309-10 Union Trust building is in charge of A. L. Beedle. The Indianapolis office at 509-10 Lemcke building, is in charge of F. T. Miles.

Stuckeman Bros., 18 Ruth street, Pittsburgh, manufacturer of small motor-driven air compressors and several specialties, in order to facilitate its expansion along various lines, has recently incorporated with a capital of $50,000. The officers are: President, W. F. Stuckeman; vice-president, H. S. Stuckeman, and secretary-treasurer, W. F. Boehmer.

General Electric Co. has purchased a 60-acre tract in Fort Wayne, Ind., on which to expand its local works. Walter S. Goll, assistant general manager of the plant, declares that the company has plans for immediate expansion which will add one-tenth to the size of the plant. He further said that the new ground will take care of future expansion that eventually may nearly double the capacity of the works. The company is contemplating the erection of a transformer shop on its newly acquired property. Two one-story buildings are planned, each affording at least 65,000 ft. of floor space. At the present time the Fort Wayne plant occupies 1,300,000 sq. ft. of floor space and under normal conditions employs about 6000 people. The erection of the additional buildings will mean employment for at least 500 more workers. The transformer business of the company has been growing very largely during recent months and the present expansion had been forecasted for some little time.

Conveyors Corporation of America, formerly the American Steam Conveyor Corp., Chicago and New York, has announced that S. D. Inman has been placed in charge of the engineering and design of its American Trolley Carrier, monorail conveying equipment for handling coal, ashes, sand, gravel, and like bulky materials from railway car to pile, bin or bunker. Mr. Inman is a conveyor engineer of considerable experience and ability, and has been associated with the Conveyors Corporation in an engineering capacity for over a year.

Michigan Stamping Co., of Detroit, has recently purchased the business of the The Toledo Metal Products Co. and will continue the manufacture and sale of the "BG" line of outlet boxes, covers, and switch boxes formerly made by that company. The business history of the Michigan Stamping Co. covers a period of over 20 years, during which time it has grown from a very modest beginning to a company employing a capital of $4,000,000. Its present plant is very modern, capable of large production and covers 6.5 acres on a site of 36.5 acres. The manufacturing of the Electrical Department will be carried on in Toledo for a short time, after which it will be moved to Detroit. A new floor 480-ft. by 60-ft. to take care of part of the manufacturing processes is now under construction. The officers of the company are John H. French, president; Henry P. Cope, vice-president, and Walter F. Tant, secretary and treasurer. A. B. Hoffman will be in charge of the Electrical Department.

Bleadon-Dun Co., 213 South Peoria street, Chicago, manufacturer of electro-medical apparatus, has announced the appointment of the Western Agencies Co., 285 Minna street, San Francisco, as its Pacific representative. The Western Agencies Co. has branch offices at 125 East 9th street, Los Angeles, and 923 Pine street, Seattle. They have an organization consisting of 18 salesmen, who call regularly on all electrical jobbers. It is the plan of the Western Agencies not only to take orders for Violetta Violet-Ray machines, but also to assist the jobber in distributing his stock among his dealers. They are prepared, with the co-operation of the Bleadon-Dun Co., to arrange complete window displays in the dealers' window and to keep frequently in touch by mail with all dealers whose names are furnished by the jobber. The Western Agencies always keep a stock of machines on hand in all their offices and are prepared to make partial immediate delivery, and are ready to lend the assistance of their sales force and other co-operation, to all jobbers handling the Violetta line.

PERSONAL MENTION

Biographical Sketches and Chronicle of Changes in Business Connections, Promotions and Other Personal News of the Industry

W. A. HILLEBRAND, San Francisco, sales engineer for the Ohio Brass Co. of Mansfield, O., sailed for the Orient Feb. 17.

WILLIAM H. THORPE, secretary of the Thorpe Electric Co., 120 Broadway, New York City, was a recent visitor to the Paris office of the American Chamber of Commerce in France.

FRANK HODSON, president of the Electric Furnace Construction Co., Philadelphia, has been elected a member of the executive committee of the Philadelphia Foundrymen's Association.

CHARLES STERLING has been appointed assistant manager of the Brantford (Ont.) plant of the Robbins & Myers Co., manufacturer of motors, generators, etc., of Springfield, O.

HOWARD LOXTERMAN, assistant to the president and sales manager of the steel forms department of the Blaw-Knox Co., Pittsburgh, has been appointed assistant general sales manager.

GEORGE J. KIRKGASSER, who has been connected with the Cutler-Hammer Manufacturing Co., Milwaukee, since 1910, has opened an office at 1734 First National Bank building, Chicago, under the name of George J. Kirkgasser & Co., to specialize in work for industrial and engineering concerns, including advertising, merchandising, publicity, etc. The service also includes organization work to develop co-operation between all works departments, selling departments and outside offices and distributors. The companies served are the Cutler-Hammer Manufacturing Co.; Pawling & Harnischfeger Co., crane and excavating machinery builders, and Frank D. Chase, Inc., engineers. In 1902-3 Mr. Kirkgasser was connected with the advertising department of the Force Food Co., and in 1903-7 he took an electrical engineering course in Syracuse University, graduating in 1907. For the next 3 yrs. he was engaged in engineering work, and began writing on technical subjects in 1909. He is the author of several books, which include "Electric Light and Motor Wiring," "Electric Control Engineering" (two vols.), and "Motors and Motor Control" (now on the press). In addition he has written articles on business, advertising and engineering subjects in practically all the leading magazines in these fields. Mr. Kirkgasser first became connected with the Cutler-Hammer Manufacturing Co. in 1910 as assistant advertising manager and technical writer, and occupied this position until 1914 when he was appointed advertising manager in charge of publicity, advertising and sales promotion.

G. J. Kirkgasser.

F. C. READ, formerly manager of the price section of the industrial department, Westinghouse Electric & Manufacturing Co., has been placed in charge of the Bluefield and Charleston (W. Va.) offices of that company, and is to be located in the Charleston office.

H. T. PIERCE re-entered the employ of the New England Power Co., at Worcester, Mass., recently as a transmission engineer. He was with the New England Power Co. until a year ago, when he went to the West Indies and took up work with a sugar refining company in San Domingo.

WILLIAM J. DAVIS, JR., Pacific Coast engineer, General Electric Co., has been transferred to the International General Electric Co. and is enroute from San Francisco to South Africa via London to make studies in connection with the proposed electrification of the government railroad between Cape Town and Pietermaritsburg, a distance of about 800 mi. This work is expected to require about a year.

M. E. GERBER, general manager of the Chesapeake & Potomac Telephone Co., heretofore located at Havre de Grace, Md., has been transferred to Baltimore, with jurisdiction over the entire system in the state. R. C. Harris, manager for the company in Cecil and Kent counties, has had his territory extended to include Caroline, Queen Anne and Talbot counties, with elimination of Cecil county; Charles R. Danecker has been made manager of Cecil and Harford counties.

DR. W. R. WHITNEY, director of the General Electric Co. research laboratory, was recently awarded the Perkin medal by the American Chemical Society, for achievement in applied chemistry. The medal is named after Sir William Perkin, British chemist who discovered processes for the manufacture of aniline dyes from coal tar. Dr. Whitney has been director of the research laboratory of the General Electric Co. since 1900 and has been active in advancing applied industrial chemistry. His most notable work has been in the development of the General Electric Co. laboratory, from small beginnings to its present position as one of the most important industrial research laboratories in the country, and in his speech of acceptance Dr. Whitney paid tribute to his co-workers for the part all played in making the laboratory what it is. Dr. Whitney was born in Jamestown, N. Y., in 1868. He graduated from the Massachusetts Institute of Technology and received a degree from the University of Leipzig. For several years he taught at the Massachusetts Institute of Technology before joining the General Electric Co. in 1900. Dr. Whitney in the early days of his laboratoroy work, devised a lamp filament from a new form of carbon which gave about 25% more light for the same wattage than the standard carbon filament lamp of that day.

Dr. W. R. Whitney.

CHARLES S. HERVEY, New York City, former public service commissioner, has become associated as consulting accountant with De Kay & Co., of the same city, specializing in corporation insurance.

H. J. MOULTON has been appointed to the position of district manager of the Southern California Edison Co., Redlands. He was formerly assistant district manager of the company's plant at Redondo.

E. L. GEMMIL, chief engineer of the structural department of the Blaw-Knox Co., Pittsburgh, left San Francisco recently for Japan, where he will design the transmission towers for the Tokyo Electric Power Co.'s new high-tension line.

ALEXANDER ENGLAND, has been appointed chief engineer of the Westinghouse Air Brake Co., Wilmerding,

Pa., to succeed S. W. Dudley, who resigned Feb. 1 to join the faculty of the Yale University as professor of mechanical engineering. Mr. England has been connected with the Westinghouse Air Brake Co. for 22 yrs. and has held the position of assistant chief engineer since 1914.

JUDGE JOHN H. ROEMER of the H. M. Byllesby Co., Chicago, recently delivered an address on the subject of "The Maintenance and Development of Public Utilities," before a meeting of the Oklahoma Utilities Association.

W. E. G. MITCHELL, vice-president of the Mitchell-Rand Manufacturing Co., New York City, manufacturer of electrical insulation products, left Feb. 13 for Florida, where he will spend the next month. He is accompanied by his family.

C. O. MINIGER, Toledo, O., vice-president of the Willys Corp., has been elected president of the United States Light & Heat Corp., Niagara Falls, N. Y., succeeding J. Allan Smith, resigned. D. H. Kelly has been elected vice-president and general manager, to succeed C. L. Lane, recently resigned.

OBITUARY.

LUTHER W. BURT, a well known hydroelectric and hydraulic engineer, died recently at his home in Hartford, Conn., at the age of 73 yrs.

JAMES SWEENEY, chief of the Pennsylvania State Bureau of Standards since its foundation in 1911, died recently in Harrisburg, Pa., aged 66 yrs.

C. H. TOWNS, of the stores department of the Commonwealth Edison Co., Chicago, died recently. He entered the service of the company in 1907 and had worked continually up to the time of his death.

WALLACE B. THOMAS died last month in Pittsburgh, aged 27 yrs. At one time he was connected with the railway sales department of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

DR. CHARLES H. LEMON, for 25 yrs. chief surgeon for the Milwaukee Electric Railway & Light Co., died Feb. 22 at St. Mary's Hospital, Milwaukee. He was 58 yrs. old and was well known for his welfare work among 20,000 electric company employes.

LAWRENCE MADDEN, of the electrical department of the Blaw-Knox Co., Pittsburgh, died recently. He was a war veteran, having served in France, where he was gassed. This injury affected his lungs, leaving them too weak to resist the attack of pneumonia which caused his death.

GEORGE HOLT LUKES, general superintendent of the Public Service Co. of Northern Illnois, with office in Chicago, and widely known among public-utility executives and electrical engineers, died Feb. 18. He was a bachelor and made his home at the Evanston University Club. Mr. Lukes was born in Racine, Wis., Dec. 6, 1869, and obtained his collegiate training at the Massachusetts Institute of Technology in Boston, from which he graduated in electrical engineering in the class of 1892. After leaving college he took a short student engineering course at the works of the General Electric Co. in Schenectady, N. Y., and late in 1892 he secured employment with the old Chicago Edison Co., as inspector, his brother, Joseph B. Lukes, having preceded him in a similar position with the same company earlier in the same year. As an electrical engineer Mr. Lukes was particularly interested in problems of transmission and distribution and in 1897 and 1898 he was active in the work of standardizing and extending alternating-current distribution in Chicago. The original Chicago Edison Co. operated a direct-current network, but the company later secured many outlying alternating-current properties, and Mr. Lukes was diligent in the work of bringing into existence a uniform system of alternating-current distribution for the outlying districts of Chicago, particularly for the north and west side. In 1898 the Chicago Edison Co. had reached the stage in its development when it became necessary to have a night operating superintendent. Mr. Lukes was selected for this position. As night operating superintendent Mr. Lukes, among other duties, was a forerunner in such work as is now done by the load dispatchers. At this time he also acted as librarian of the company. In August, 1902, Mr. Lukes left the Edison company to become superintendent at Evanston of the North Shore Electric Co., which then supplied electric light and power to the suburban area north of Chicago. Soon after he was made general superintendent of this company and when the North Shore and several other public-utility companies were combined into the present Public Service Co. of Northern Illinois in 1911, Mr. Lukes was appointed general superintendent of the new company, with headquarters in Chicago. He retained this position until his death. Mr. Lukes' life work was that of public-utility development. Never losing his interest in engineering, he became an administrator of ability and good judgment. He was a man who made friends and retained them. He could be firm when firmness was required; he stood for his principles; but he did not antagonize people. He had a keen sense of justice; he was never too busy to listen to the troubles of the men under him and to sympathize with them and assist them. A doer rather than a great talker, the decedent possessed a quiet humor which his friends enjoyed. He was very well liked and his circle of friends and acquaintances was large. He was a great reader, appreciated music and art, and was an amateur golf player of more than ordinary skill. The decedent took an intelligent interest in many subjects and was a member of a number of professional and other societies. He wrote a numbers of papers and his counsel was valued in committee work. He was a member of the American Institute of Electrical Engineers, Western Society of Engineers, Illuminating Engineering Society, National Electric Light Association, Chicago Engineers' Club, Electric Club of Chicago, University Club of Chicago, Evanston University Club, Glenview Golf Club and Park Lodge No. 833, A. F. & A. M. He was also a life member of the Art Institute of Chicago and a sustaining member of the Chicago Society of Etchers. For many years he served on the Advisory Committee of the Commonwealth Edison Co., as well as several committees of the Public Service Co. of Northern Illinois, including the Budget and Expense Committee. Three brothers survive: C. L. Lukes of San Diego, Cal.; Joseph B. Lukes of Seattle, Wash., and C. N. Lukes of Miles City, Mont. The funeral services, held on Feb. 21 at the Evanston University Club, were largely attended, Rev. Dr. Arthur Rogers officiating. There were many beautiful floral tributes. The honorary pallbearers were Samuel Insull, Frank J. Baker, C. A. Munroe, John F. Gilchrist, John H. Gulick and T. V. Purcell. The active bearers were L A. Ferguson, Fred R. Jenkins, Homer E. Niesz, E. W. Lloyd, Ernest A. Edkins and Robert L. Elliott.

G. H. Lukes.

EDWARD B. HATCH, president of the Johns-Pratt Co., Hartford, Conn., fuse insulators and packing manufacturer, died Feb. 18. He was born in Hartford, Dec. 20, 1861, and served in several public offices. He was a director of Hartford banks, insurance and industrial companies, and belonged to several clubs in that city and New York. Mr. Hatch was prominent in the management of the Associated Manufacturers of Electrical Supplies, and was a director in the Hart & Hegeman Manufacturing Co. and the Jewell Belting Co. of Hartford. He possessed a very wide acquaintance in electrical and allied fields.

FRANK PICKERNELL, for many years a member of the engineering staff of the American Telephone & Telegraph Co., died Feb. 12 at his home in Englewood, N. J. He was born in Boston, March 28, 1865, and graduated in 1885 from the Massachusetts Institute of Technology as an electrical engineer, entering the employ of the American Bell Telephone Co. in the following year. Coming to New York City in September, 1887, as superintendent of equipment for the American Telephone & Telegraph Co., operating the long-distance telephone lines, he advanced rapidly in telephone work. He was active in the company's construction work at the time the first long-distance line was opened between New York and Chicago, played an important part in the introduction and development of the composite system of simultaneous telephony and telegraphy, and rendered valuable service to the company as an expert on long-distance telephone communication until he ceased active telephone work about 2 yrs. ago. Mr. Pickernell was one of the first members of the American Institute of Electrical Engineers, holding the fifth emblem of the Institute given to members at the time of organization. He was also a member of the Telephone Pioneers of America.

BUSINESS OPPORTUNITIES

News of Electrical Construction Projects in All Parts of the Country, Proposals Invited, Foreign Trade Openings and New Companies

EASTERN STATES.

Manchester, N. H.—The Manchester Traction, Light & Power Co. has arranged for a bond issue of $914,000, a portion of the proceeds to be used for extensions, financing, etc. The company furnishes service at Manchester and Nashua, and vicinity, including 17 municipalities. It operates a series of hydroelectric power plants, with extensive transmission system.

Boston, Mass.—The Bureau of Yards & Docks, Navy Department, Washington, D. C., has commenced the erection of a one-story radio building at its local station.

New Bedford, Mass.—The Pierce Mfg. Co. is arranging for the installation of equipment at its power house to use oil fuel for operation instead of coal, as heretofore. The Grinnell Mfg. Co. will make a similar improvement at its plant.

Worcester, Mass.—The Worcester Consolidated Street Railway Co. has commenced the erection of a one-story building, 25 by 48 ft., on Grove street.

New Milford, Conn.—The New Milford Electric Light Co. has made application to the State Legislature for permission to increase its capital to $200,000.

Albany, N. Y.—The State Hospital Commission, Capitol building, E. S. Elwood, secretary, will soon call for bids for the erection of an addition to one of the state power plants, with improvements in present station, estimated to cost about $125,000. The commission will also install electrical and refrigerating equipment at the hospital at Central Islip, L. I.

Delancey, N. Y.—The Delancey Electric Light Co., Inc., has filed application with the Public Service Commission to construct and operate a local electric power plant with distributing system.

Long Island City, N. Y.—The Moto-Meter Co., manufacturer of automobile precision equipment, has filed plans for the erection of a one-story power house at its factory on Wilbur avenue.

New York, N. Y.—The installation of a radio system has been arranged for the local police department. The wireless apparatus will be capable of a 300-mi. radius, and will be used primarily for notifying authorities in other cities concerning the movements of suspected criminals and the like. The work is in the experimental stage, and numerous improvements and extensions are planned.

New York, N. Y.—The New York Edison Co., Irving Place and Fifteenth Street, has filed plans for the erection of two substations, each 3-story, brick. The first will be 39 by 56 ft., located at 120-24 Cedar street, and estimated to cost $120,000; the other will be about the same size, located at 159-61 Green street, and will cost $160,000.

Old Forge, N. Y.—The village council is having plans prepared for the construction of a municipal electric power plant to be operated in conjunction with waterworks system, estimated to cost about $50,000. William D. Morris is clerk.

Utica, N. Y.—Work will be started in the near future on a large modern steam turbine electric generating station for the Utica Gas & Electric Co. which will have a capacity of 50,000-power units, and will be erected at a point formed by a bend in the Mohawk river opposite the Barge Canal harbor. The cost is estimated at $1,750,000. Wm. J. Reggan is commercial manager of the corporation.

Watertown, N. Y.—The Northern New York Utilities, Inc., has made application to the Public Service Commission for authority to build an addition to its electric power plants at Alexandria and Theresa (Jefferson county), and for approval of franchises for line construction and operation granted by these municipalities.

Belvidere, N. J.—Paul T. Brady, Westinghouse Electric & Mfg. Co., 165 Broadway, New York, and associates, are perfecting plans for the initial power plant to be constructed in connection with an extensive hydroelectric power project in this district. The plant will be located in the vicinity of Belvidere, and is estimated to cost close to $3,000,000; it will be of hydroelectric type, with emergency steam-operated equipment to be used in low water periods. The station will have a capacity of about 300,000-hp.

Dover, N. J.—The board of water commissioners has arranged for the installation of motors at the city pumping station. The entire plant is being electrified.

Elizabeth, N. J.—Considerable electrical and mechanical equipment will be installed in the proposed additions to the shipbuilding plant of the Bethlehem Shipbuilding Corp., Front street, comprising the former works of the Samuel L. Moore & Sons Corp. Tentative plans are under way, and it is proposed to commence construction during the summer. The project is estimated to cost close to $1,000,000.

Keasbey, N. J.—The board of lighting commissioners is planning for extensions and betterments in the street-lighting system in the township.

Perth Amboy, N. J.—The board of aldermen has approved an ordinance providing for the installation of an improved street-lighting system on Madison avenue, from Market street to Fayette street. The system will be of "white way" type. The lamps and light committee has also been authorized to purchase a welding outfit for use in its department.

Trenton, N. J.—In connection with a budget for the coming year, the Lawrence township committee is arranging an appropriation for street-lighting.

Allentown, Pa.—The city water department, Thomas J. Roth, superintendent, has arranged for the installation of pumping machinery at the city pumping plant, to be electrically operated.

Altoona, Pa.—The school board will take bids at once for the construction of a 2-story power plant, 100 by 120 ft., on Sixth avenue, to be used for schools in this district. The plant will cost about $200,000 with machinery. The Wood, Hulse & Yates Co., 233 Broadway, New York, are engineers.

Bradford, Pa.—The City Gas & Power Corp. has filed schedules in bankruptcy with liabilities stated at $172,739.69, and assets, $92,115.30. An involuntary petition was filed against the company Dec. 16.

East Berlin, Pa.—The East Berlin & Abbottstown Electric Light Co., recently organized, is planning for the installation of a distributing system at East Berlin and Abbottstown. Negotiations are under way with the borough councils, and work will be commenced as soon as franchises are granted. P. C. Smith is president and E. D. Lau, secretary.

Harrisburg, Pa.—The city council is considering an ordinance introduced by Commissioner S. F. Hassler, providing for the installation of lamps in certain parts of the city, including 600 and 100-cp. units. A number of fire alarm boxes are also authorized in the measure.

Hauto, Pa.—The Pennsylvania Power & Light Co. has awarded a contract to Albert Doak, Philadelphia, for boiler settings at its power plants at Allentown and Hauto, to cost about $30,000. The work is preliminary to a number of extensions and improvements at the plants.

Littletown, Pa.—The board of directors, Hoffman Orphanage, is taking bids for improvements in the power house at the institution, to include the installation of mechanical and electrical equipment. The work is estimated to cost about $30,000.

Philadelphia, Pa.—The Philadelphia Electric Co., Tenth and Chestnut streets, is planning for the construction of a loading platform at its plant at Twenty-third and Market streets, to cost about $8,000.

Pittsburgh, Pa.—The chamber of commerce has arranged for the installation of a wireless telephone system for the transaction of business.

The radio telephone will connect with a number of operators within a large radius of the city.

Mount Carmel, Pa.—The borough council has approved plans for the installation of an electric fire alarm system.

Pittsburgh, Pa.—The Duquesne Light Co. has taken title to a tract of property fronting on the Pittsburgh & Western Railroad, totaling about 14 acres, in the Springdale district. It will be used by the power company in connection with future operations.

Reading, Pa.—Electric companies operating in the vicinity of Hamburg are planning for a number of transmission and distributing line extensions in Berks county.

Williamsport, Pa.—The Demarest Silk Mills are considering plans for the erection of a one-story power plant, 50 by 90 ft., for general factory service. Stearns & Woodnut, Stephen Girard building, Philadelphia, are architects.

Wernersville, Pa.—The board of directors, Wernersville State Asylum, J. M. Shenk, chairman, has awarded a contract to J. H. Greinger, 826 Walnut street, Lebanon, Pa., for extensions in the power house at the institution to cost about $22,000.

Annapolis, Md.—The Bureau of Yards & Docks, Navy Department, Washington, D. C., is perfecting plans for extensions and improvements in the local power house, to include boiler equipment, piping, etc.

Baltimore, Md.—The board of works is considering plans for the establishment of an electrically operated garbage disposal plant. An experimental plant is now being constructed in the western section of the city.

Baltimore, Md.—The Consolidated Gas, Electric Light & Power Co., Lexington building, is considering the erection of a one-story building at Madison and Graves street.

Baltimore, Md.—The hospital commission will install considerable electrical and mechanical equipment in the proposed municipal hospital for infectious diseases to be built on a local site. Negotiations are under way for an appropriation of $750,000 for the building.

Baltimore, Md.—The water department has awarded a contract to the Westinghouse Electric & Mfg. Co., 121 East Baltimore street, for electrical equipment to be installed at the eastern pumping station of the local waterworks.

Baltimore, Md.—The Western Maryland Railroad Co. is perfecting plans for placing its coaling pier at Port Covington in service about Mar. 15, and an official test of the plant will be made late in February. The pier is electrically operated, with maximum capacity of forty cars of 50-tons of coal each per hour, or 20,000-tons in a ten-hour day. Plans are under way for a number of extensions in the plant, to cost about $250,000, including additional electric and mechanical equipment.

Crisfield, Md.—The office of the Crisfield Light & Power Co., including show-rooms and other departments, was destroyed by fire Jan. 30. Rebuilding work will be placed under way at an early date.

Westminster, Md.—The Carroll county school board will take bids at once for the construction of its proposed electric power plant at Hempstead.

Norfolk, Va.—The Norfolk & Western Railway Co. has arranged an appropriation of $18,000,000 for extensions and improvements, new rolling stock, etc. A considerable portion of the work will require electrical equipment, and includes a power plant and general repair shops for large locomotive work, to cost about $1,000,000; electrification of Piers No. 2 and 3 at Norfolk, with the installation of considerable electrically operated machinery for coal handling, estimated to cost $650,000; installation of machine tools and equipment, including electrically operated apparatus, to cost $600,000; freight terminal at Bristol, including electrical and mechanical installation, to cost $1,300,000. N. D. Maher is president.

Charleston, W. Va.—Electrical equipment, refrigerating and mechanical apparatus will be installed in the cold storage plant to be constructed here by G. L. Robinson, Winchester, Va. The plant will be three-story, and is estimated to cost about $75,000. Quigley Hafer, 155 Garfield street, Chambersburg, Pa., is engineer.

Fairmont, W. Va.—The Fort Grand Coal Co., Morgantown, W. Va., recently organized with a capital of $80,000, is planning for the installation of electrical and mechanical equipment at its local properties. About 200-acres of coal land will be developed. W. T. Hughes is president and manager.

Washington, D. C.—Congress is considering a bill, introduced by Representative Langley, Kentucky, authorizing the chief of engineers, United States Army, to grant permits for the installation of underground conduit lines for electrical service in the public grounds under his control in the District of Columbia.

Washington, D. C.—C. I. Kephart, 1415 Rhode Island avenue, has applied to the Federal Power Commission for a preliminary permit to construct a dam at the outlet of Spirit lake, tunnel and canal to power house on Toutle river, in Skamania and Cowlitz counties, Washington.

Dunn, N. C.—The city council has plans under way for extensions and improvements in the municipal electric power plant to cost about $100,000. Bonds for this amount will be issued.

Anderson, S. C.—The Centerville Electric Light Co., recently organized, will operate an electric light and power system in this section. W. G. Gilmer is president.

Gaffney, S. C.—The board of directors, Cherokee county home, is planning for the installation of a light and power system at the institution.

Ocala, Fla.—Plans are under way for power development on the Wichlacooche river.

Punta Gorda, Fla.—The city council is planning for the installation of a new street-lighting system.

NORTH CENTRAL STATES.

Bay Village, O.—The Northern Light & Power Co. plans to erect an electric power plant at an estimated cost of $60,000.

McConnelsville, O. — The McConnelsville-Malta Electric Co. has applied to the Federal Power Commission for license to construct a power house at the U. S. dam No. 7 on the Muskingum river, Malta, Ohio.

Marlette, Mich.—Clarence Hubbell, engineer, 2338 Penobscot building, Detroit, has prepared plans for the erection of an electric light and water works plant. The city clerk is in charge.

Chicago, Ill.—The Great Western Laundry Co., 2319 West Madison street, plans to erect a power plant and 3-story works at an estimated cost of $250,000.

Chicago, Ill.—The Lincoln Park Commissioners will expend $200,000 for widening Michigan avenue between Pearson street and Oak street. The lighting system will be changed by these improvements.

Springfield, Ill. — The Springfield City Commission and the Springfield Electric & Gas Co. have reached an agreement under which the city is to obtain possession of the company's lighting and heating plant. A holding company is to be formed to finance the plan. Arbitrators are to fix the price the city will pay and ten-yr. bonds are to be issued. This agreement is to be submitted to a referendum vote Feb. 22. Following the date, the question of authorizing the bonds will be submitted.

Prairie du Chien, Wis.—The Prairie City Electric Co. has increased its capital stock from $30,000 to $75,000 for proposed expansion of its facilities.

Racine, Wis.—The Milwaukee Electric Railway & Light Co., operating the local electric lighting plant, is being petitioned by residents of Franksville, Thompsonville and farmers northwest of Racine to build a distributing line from Racine through the district, in order that the petitioners may have electricity for lighting and power.

Griswold, Ia.—A company has been organized here with a capital of $50,000 for the purpose of constructing an electric light and power plant. The project is being promoted by the business men of the city, and it is hoped to begin work on the plant this summer.

Oshkosh, Wis.—Wm. Baehr, Oshkosh Gas Light Co., is preparing plans for an ormanental street lighting system for the city, for which bids will be received.

Milwaukee, Wis.—The Milwaukee Electric Railway & Light Co. plans to construct a second unit to its electric generating plant.

Independence, Mo. — Black & Veatch, engineers, 701 Mutual building, Kansas City, Mo., have prepared plans for the erection of an electric lighting plant for the city. Jas. Craig is city clerk.

Linn Creek, Mo.—The Missouri Water Co. has been organized with

a capital of $550,000. Plans are under way for the construction of a dam on the Niangua river to generate electric power. Sid C. Roach is in charge.

Moberly, Mo.—Bids will be received March 10 by W. H. Wilson, city clerk, for improving the municipal waterworks system. Specifications include a brick power house building and 5 mi. of three-phase transmission lines.

Milford, Neb.—Bonds have been voted for the purpose of erecting a municipal electric-lighting plant.

Castlewood, S. D.—A special election will be held to vote on the question of issuing bonds in the sum of $18,000 for the erection of an electric light and power plant.

SOUTH CENTRAL STATES.

Walton, Ky.—The electric light commission is perfecting plans for the erection of a one-story municipal electric power plant, to comprise three oil-operated engines, belt-connected to three electric generators. Bids for certain features of the work have been taken. Robert W. Jones is chairman of the light commission.

Knoxville, Tenn.—B. H. Sprankle, 426 Union avenue, plans installing an electric light plant in a garage.

Memphis, Tenn.—The city contemplates installing an electric power plant. Bids will be received March 1. C. O. Pfeil, 1403 Union and Planters' building, is architect.

Andalusia, Ala.—The Andalusia Light & Power Co. is planning for the installation of a turbo-generator at its power plant, with auxiliary operating equipment.

Florence, Ala.—The Muscle Shoals Gas Co. has been incorporated with a capital of $600,000, to manufacture gas and general electricity. Claude Hamilton is interested.

Newton, Ala.—The Houston Power Co. has plans under way for the construction of a dam 50-ft. high on the Choctawhatchee river, with a power house in the dam.

Tuscaloosa, Ala.—The board of directors, Alabama Home for Feeble-Minded, has taken bids for the construction of an electric light and power plant at the institution.

Duncan, Okla.—The city council is planning for extensions in the electric light and power plant, in conjunction with waterworks system to cost about $150,000.

Duncan, Okla. — An electric light and power system is to be erected here. Address R. W. Cline, Duncan Electric & Ice Co.

Mountain View, Okla.—The borough concil is planning for the installation of machinery in the municipal electric power plant; extensions will also be made in the pumping plant at the city waterworks. V. V. Long & Co., 1300 Concord building, Oklahoma City, Okla., are engineers.

Bastrop, Tex.—The Farmers' Gin & Ice Co. is reported to be planning for extensions in its hydroelectric power plant.

Coleman, Tex.—The city will install a 250-hp. boiler, generator and exciter costing about $10,000. H. M. Thomson is commissioner.

Mission, Tex.—The city has voted $100,000 in bonds to improve and extend street lighting, water and sewer systems, paving, etc. The mayor is in charge.

Plainview, Tex.—The Texas Utilities Co. plans extending its lines to Kress and Tulia. J. Scott is manager.

San Antonio, Tex.—The San Antonio Public Service Co. has plans under way for the proposed addition to its local electric generating plant to cost about $250,000, including improvements to present building. Considerable machinery will be installed. The company recently increased its capital from $4,700,000 to $7,000,000 for expansion.

Spur, Tex.—Grogan & Stovall, Vernon, Tex., have purchased the Spur Light & Power Co. They are planning the construction of a powerhouse and buildings.

WESTERN STATES.

Denver, Colo.—James F. Myser and Edward E. Drach, care of Edward E. Drach, 1133 Clarkson street, have applied to the Federal Power Commission for license to erect a series of nine small diversion dams and pipe lines leading to a succession of five power houses on the Frying Pan river, Colorado.

Boise, Ida.—The mayor has applied to the Federal Power Commission for a preliminary permit to construct a diversion dam on the north fork of the Payette river, reservoir, pipe line to power house on the south fork of Payette river; a second diversion dam on the south fork at the head of the Stairs rapids, reservoir and conduit to above mentioned power house.

Brigham City, Utah—The municipal electric light plant will be rebuilt soon. The city will purchase the water wheel and its complementing equipment; the switchboard and all electrical fixtures; build the intake and power house and set up the machinery under a separate contract. The work will begin immediately. C. O. Roskelley is city manager.

Salt Lake City, Utah—The Utah Power & Light Co. has applied to the Federal Power Commission for a permit to erect a 260-ft. dam on the Green river in southeastern Utah. It is proposed to erect a power plant of 8000-hp. capacity, which will furnish power for the vicinity of Salt Lake City and parts of Wyoming.

Raymond, Wash.—The business men of the town have raised $25,000 to secure the location of Lewis Mills & Timber power plant from site at South Bend to new proposed site here. This will cost about $30,000, for buildings and equipment.

Salem, Ore.—With a view of securing immediate action on the development of Oregon's immense waterpower resources, a senate joint resolution, sponsored by Senators Joseph and Norblad, and Representatives Bean and Woodson, proposes to submit to the voters of the state at the next election, the question of creating a hydroelectric commission and bonding the state in an amount not to exceed 4% of its assessed valuation—nearly $40,000,000—for acquisition, construction and development of hydroelectric power plants and the generation and transmission of power.

Oroville, Cal.—Plans for the construction of an impounding dam at the foot of Concow valley, to contain thousands of acre feet of water to be used for irrigation as well as for the manufacture of hydroelectric energy are under consideration. Wm. Boucher is secretary of the chamber of commerce.

INCORPORATIONS.

New York, N. Y.—Meter Service Corp. Capital, $25,000. To manufacture electrical instruments and equipment. Incorporators: F. W. Douglas, S. A. Galvert, and G. E. Scobal, 1790 Broadway.

New York, N. Y.—Angle Lamp Co. Capital, $55,000. To manufacture electric lighting equipment and electric lamps. Incorporators: B. L. Hewitt, L. Whitcomb and A. V. McMahen, 110 West 40th street.

New York, N. Y.—S. L. Anderson Electric Service Co. Capital, $10,000. To engage as electrical engineers. Incorporators: A. T. Rose, H. G. Sauldner and S. L. Anderson, Stony Point.

Newark, N. J.—Central Electrical & Hardware Co. Capital, $50,000. To manufacture electrical equipment and hardware specialties. Incorporators: Francis Gonzalez, Wm. C. Daly and Magne Kjellesvig, 539 Central avenue.

New York, N. Y.—Watts & Barry, Inc. Capital, $5,000. To operate an electrical contracting business. Incorporators: W. C. Biekrover, M. Hennessy, and J. L. Schumacher, 129 Halsey street, Brooklyn.

Hoboken, N. J.—J. L. Hemphill & Co., 1118 Clinton street. Capital, $30,000. To engage as electrical engineers. Incorporators: Charles D. Silleck, J. L. Hemphill and Harold D. Hemphill.

Newark, N. J.—Univitra Corp., 56 Broad street. To manufacture electrical equipment. Edwin G. Adams, 790 Broad street, heads the company.

Brooklyn, N. Y.—Manutil Corp. Capital, $10,000. To manufacture motors and engines. Incorporators: W. C. Adams, J. J. Munro and A. J. Brislin, Richmond Hill, N. Y.

Rochester, N. Y.—Pomeroy Electric Co. Capital, $40,000. Incorporators: B. H. Pomeroy, S. S. R. Robinson and H. N. Bennett.

Boston, Mass.—Electric Machinery Corp. Capital, $100,000. Incorporators: Howard D. Moore, Somerville, Mass.; L. W. Peters and Fred E. Crawford, Watertown, Mass.

Chicago, Ill.—Dexter-Reynolds Manufacturing Co. Capital, $25,000. To manufacture washing machines, etc. Incorporators: Al Dexter, L. M. Kerrigan and C. H. Reynolds, 118 North LaSalle street.

Sault Ste. Marie, Ont.—A. E. Wade, Ltd. Capital, $150,000. To manufacture motors, engines, etc. Incorporators: Abel E. Wade, John A. Mac Innis and Gavin Shanks.

FINANCIAL NEWS

Comment on the Financial Outlook in the Electrical Industry, New Securities, Reports of Earnings, Dividends and Utility Stocks

Issue of Pennsylvania Power & Light Co. Bonds.

Guaranty Company of New York, Halsey, Stuart & Co., Chicago, Harris Trust & Savings Bank, Chicago, Brown Brothers & Co., Chicago, are offering an issue of $8,000,000 Pennsylvania Power & Light Co. first and refunding mortgage bonds, series A, 7%, dated Feb. 1, 1921, at 92 and interest, to yield about 7.68%. The Pennsylvania Power & Light Co. owns and operates electric power, light and gas properties in an extensive territory in Eastern Pennsylvania, with a population estimated at 650,000, including the industrially important and prosperous Allentown-Bethlehem-Northampton - Slatington section. The proceeds of these series A bonds will be used in part for the retirement of current indebtedness heretofore incurred for capital expenditures and will provide funds available for additional construction.

Idaho Power Co.

Earning statement of Idaho Power Co. for the twelve months ended Dec. 31, 1920, show large increases over 1919. Gross amounted to $2,282,153, against $1,777,832 for the previous year, while net after taxes increased from $868,072 in 1919 to $1,170,865 in 1920. Balance after preferred dividends totaled $678,459, and compares with $408,678 for the twelve months previous.

American Light & Traction Co.

For the twelve months ended Dec. 31, 1920, net earnings were $3,051,494, equal after deduction of preferred dividends to $8.08 a share, earned on $27,198,300, against net of $4,142,863, or $13.13 a share earned on the $25,097,100 common stock in 1919.

Pacific Gas & Electric Co.

The preliminary income account for the year ended Dec. 31, 1920, shows surplus after all charges and taxes was $3,915,854, equivalent after deduction of preferred dividends to $6.28 a share earned on the $34,004,058 common stock, as compared with $3,340,353 or $5.32 a share earned in the preceding year.

Allis-Chalmers Mfg. Co.

Allis-Chalmers Mfg. Co. in its forthcoming report will show a net profit of well over $3,000,000 after very liberal charges for depreciation, etc. The report is due to be made public very soon. Allis-Chalmers carried over from last year close to $15,000,000 in forward orders and now is aid to be booking at the rate of about 50% of capacity.

Central Illinois Light Co.

The Central Illinois Light Co., Peoria, Ill., has applied to the Illinois Public Utilities Commission for permission to issue $500,000 preferred stock and $1,300,000 30-year 5% gold bonds.

National Conduit & Cable Co.

For the year ended Dec. 31, 1920, the company reports a deficit of $1,222,752, after taxes and all charges, as compared with a deficit of $1,116,340 in the previous year.

Sandusky Gas & Electric Co.

	1920.	1919.
December operating revenues	$80,360.97	$65,449.34
Operating expenses and taxes	69,099.33	58,765.45
Operating income	$11,261.64	$ 6,683.89
Amount of maintenance expenditures included in above operating expenses	$ 1,905.86	$ 1,859.87

Northwestern Ohio Railway & Power Co.

	1920.	1919.
December operating revenues	$35,070.20	$27,037.93
Operating expenses and taxes	36,126.21	25,474.01
Operating income	$ 1,056.01†	$ 1,563.92
Amount of maintenance expenditures included in above operating expenses	$11,490.56	$ 5,295.31

†Deficit.

Dayton Power & Light Co.

	1920.	1919.
December gross earnings	$400,660	$332,820
Operating expenses (including depreciation and taxes)	307,404	208,908
Net earnings	93,256	123,912
Non-operating revenue	1,161	3,212
Total income	94,417	127,124
Interest on bonds	37,244	32,113
Other deductions (includes other interest and sinking fund)	12,542	62,976
Total deductions	49,786	95,089
Net income	44,631	32,035
Dividends on preferred stock	17,892	17,379
*Surplus	26,739	14,656
Operating ratio	76.72%	62.77%

Adirondack Power & Light Corp.

	1920.	1919.
December gross	$ 446,699	$ 401,597
Net after taxes	158,590	136,654
Surplus after fixed charges	64,892	81,506
Twelve months' gross	4,714,526	3,865,263
Net after taxes	1,213,131	1,387,129
Surplus after fixed charges	476,729	818,222

Buffalo General Electric Co.

The Buffalo General Electric Co. has issued a statement showing surplus profits in 1920 after fixed charges, of $911,944, equal to $11.41 per share on the capital stock.

Kansas City Power & Light Co. Calls Stockholders' Meeting.

A special meeting of stockholders of the Kansas City Power & Light Co. was called Feb. 21 for the purpose of amending articles of incorporation so as to provide in respect to dividends being paid on the first preferred stock in cumulative monthly dividends at such rates not to exceed 8% annually as the board of directors shall determine, payable out of net earnings of the company before any dividend shall be paid on any other preferred or common stock of the company.

Ohio Power Co.

	1920.	1919.
December gross	$ 612,479	$ 386,016
Net after taxes	192,653	108,716
Total income	280,816	200,672
Surplus after charges	187,484	111,287
Twelve months' gross	5,749,452	4,450,872
Net after taxes	1,187,060	1,436,488
Total income	2,278,734	1,822,723
Surplus after charges	1,166,552	933,149
Balance after preferred dividends	996,638	858,604

Alabama Power Co.

	1920.	1919.
December gross	$ 394,373	$ 302,370
Net after taxes	181,433	151,727
Twelve months' gross	4,190,495	2,955,582
Net after taxes	2,118,832	1,586,945

Dividends.

	Term.	Rate.	Payable.
Am. P. & L.	Q	1%	March 1
Blackstone Valley G. & E. com.	Q	$1.00	March 1
Cities Service	Mo.	1.5%	April 1
Cities Service	Mo.	1.5%	April 1
Cities Service	Mo.	.5%	April 1
Cities Service stk.	Mo.	1.375%	April 1
Galv-H. El. pf.	SA.	$3.00	March 15
Ga. Ry. & Elec.		$2.00	Feby. 20
General Electric	Q	$2.00	April 15
Keokuk Elec. pf.	Q	$1.50	Feby. 15
Lindsay Light pfd.	Q	1.75%	March 31
So. W. Pr. & Lt. pf.	Q	1.75%	March 1

WEEKLY COMPARISON OF CLOSING-BID PRICES OF SECURITIES OF LEADING ELECTRICAL COMPANIES.

Quotations furnished by F. M. Zeller & Co., Rookery Bldg., Chicago.

Public Utilities—	Div. rate. Per cent.	Bid Feb.15.	Bid Feb. 22.
Adirondack Electric Power of Glens Falls, common	6	13	13
Adirondack Electric Power of Glens Falls, preferred	6	72	71
American Gas & Electric of New York, common	..	99	103
American Gas & Electric of New York, preferred	6	37	37
American Light & Traction of New York, common	..	92	108
American Light & Traction of New York, preferred	6	79	80
American Power & Light of New York, common	4	45	47
American Power & Light of New York, preferred	6	64	65
American Public Utilities of Grand Rapids, common	..	9	8
American Public Utilities of Grand Rapids, preferred	7	19	17
American Telephone & Telegraph of New York	..	100	99
American Water Works & Elec. of New York, common	..	3	3
American Water Works & Elec. of New York, particip	7	6	5½
American Water Works & Elec. of New York, 1st preferred	..	40	40
Appalachian Power, common	..	3	4
Appalachian Power, preferred	7	21	22
Cities Service of New York, common	+extra	254	248
Cities Service of New York, preferred	6	69	69
Commonwealth Edison of Chicago	8	106	102
Comm. Power, Railway & Light of Jackson, common	..	14	13
Comm. Power, Railway & Light of Jackson, preferred	6	34	34
Federal Light & Traction of New York, common	..	6	6½
Federal Light & Traction of New York, preferred	..	42	42
Northern States Power of Chicago, common	..	46	49
Northern States Power of Chicago, preferred	ex.div.7	79	79
Pacific Gas & Electric of San Francisco, common	..	48	47½
Public Service of Northern Illinois, Chicago, common	7	75	71
Public Service of Northern Illinois, Chicago, preferred	6	81	81
Standard Gas & Electric of Chicago, common	..	12½	12
Standard Gas & Electric of Chicago, preferred	8	35	36
Tennessee Railway, Light & Power of Chattanooga, common	..	1	1
Tennessee Railway, Light & Power of Chattanooga, preferred	6	5	5½
Western Power of San Francisco, common	..	25	25
Western Union Telegraph of New York	extra	88	87
Industrials—			
Electric Storage Battery of Philadelphia, common	4	99	98
General Electric of Schenectady	8	128	128
Westinghouse Electric & Mfg. of Pittsburgh, common	7	45	46